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## TRANSLATION.

### Subcutaneous Injection of Oxygen in Veterinary Practice.

By Prof. J. Cuille and Mons. Darraspen, Veterinary School, Toulouse.

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The use of oxygen by inhalation has long been employed by medical men in cases of asphyxia and dyspnœa, and veterinarians have, in cases of very valuable animals, also used it in treating the serious forms of pneumonia.

Oxygen is usually given by means of a mask to which is attached a tube leading to the oxygen container. The method has many disadvantages; large quantities of gas are required and the inhalations have to be continued for a long time to get good results. In addition, the bronchi and bronchial branches are then in a state, associated with the feeble respirations, unsuited to assist in the absorption of the gas. Some physiologists are of the opinion that the gas is not of much use in asphyxia as it is very slow in action, takes a long time to administer and is costly; for example, in a case of broncho-pneumonia in a child it is recommended to use 800 to 1,000 litres in twenty-four hours and in the course of an illness certain sick persons have been given 12,000 to 15,000 litres of oxygen.

Giving the gas intravenously seems to be much more rational, as it is carried direct to the tissues in the blood, thus reviving the cellular elements. Contrary to what has been stated, this method does not produce gas embolism as it is at once absorbed. In the horse Bouchet and Larieux have obtained by this method very good results in treating cases of pneumonia. One dose daily of five litres injected at the rate of one litre in three minutes can be given without any danger. Nevertheless, the fear of embolism or of dilatation of the heart has prevented this method of gas administration, except in cases of extreme urgency.

A third method of introducing oxygen into the organism, *i.e.*, by subcutaneous injection, has during the last few years developed. It is the best way to convey the gas to the tissues; it is more active and more efficacious than by inhalation and it does not expose the patient to the supposed danger of the intravenous method. This method was employed as far back as 1775 by Spallanzani and by Leconte and Demarquay in 1859. It was again accidentally observed by Domine of Valence, in 1900, when, injecting serum, the apparatus choked and only air was administered. Domine with Chabas later studied the subject and recommended the method in cases such as meningitis and typhoid fever. In France it remained for Ramond in 1910 to describe the technique and show the importance of the method. "It is," said he, "an agonising situation when one finds oneself in the presence of one of the numerous cases of asphyxia where we are obliged to admit that we are powerless—we turn to oxygen inhalation only to find that the gas does not reach its destination, being arrested *en route* by obstacles—tracheal, bronchial, or alveolar." Oxygen injected under the skin in such a case gives unhoped-for results. Since 1900 numerous clinicians—Beroud, Martinet, Heckel, Mery, etc.—have used with success oxygen subcutaneously injected, and many different apparatuses have been invented to facilitate the diffusion of the gas.

Amongst our animals, oxygenotherapy by subcutaneous injection has been reported on by Brunschwig, who injected air in place of oxygen in hæmoglobinuria and in the treatment of infectious diseases in the pulmonary form affecting the lungs and heart of the horse.

We have for two years used systematically this method in the treatment of a certain number of cases, in particular lung affections which so often are complications associated with the diseases of young dogs. The authors give a detailed description of several apparatuses, which include those of Ramond, Bovier-Lapierre, Lian-Navarre, Dieulafoy, Heckel, Bayeux and Dr. Lesieur; a diagram is given of the apparatus of the last-named, which is stated to be a very precise instrument, but very dear. The oxygen is made when wanted by the action of water on perborate of sodium, or the action of permanganate of potass, or bichromate of potass, on hydrogen peroxide.

The authors continue by stating: "We have for two years used a simple apparatus which consists of a cylinder, containing a reserve of oxygen under a pressure of 150 to 200 atmospheres, closed by a suitable tap; from this the gas is allowed to escape under weak pressure as desired through a tube in the passage of which is a cotton wool filter in order to prevent the passage of any impurities; to the end of the tube is attached a Pravaz syringe needle. The pressure under which the gas is injected can be measured by placing, between the needle and the cylinder, a T glass tube to which is attached a gauge; the T glass tube is filled with water through which the gas bubbles and at the same time raises the water in the gauge, thus showing the pressure of the gas in the connective tissue. The method of using it is to sterilise the syringe needle either in boiling water or in the flame of a spirit lamp, then introduce the needle in the same way as for a subcutaneous injection and in a place where the aponeurosis is

deep—this is ascertained when one can move the needle easily from side to side. The formation of a bubble under the skin assures one that the needle is in the correct place ; fifteen to twenty-five centimetres of the water pressure is enough to allow a regular passage of the gas. If the pressure on the gauge suddenly rises, this indicates that there is some obstruction to the passage of the gas such as the point of the needle in the skin, or the muscle, or that the needle is blocked by some particle. In general, one passes 200 to 300 c.c. in ten minutes. The operation is easily made in animals as, in general, the connective tissue is loose and distends easily. We have injected doses of one litre in five minutes without any pain or accident either at the time or later. Some operators have suggested that small doses should be given at the commencement and that they should be gradually increased—we have not seen any necessity to do so. The subcutaneous tissue tolerates without inconvenience large doses of oxygen ; in man it has been injected in certain grave cases at one time up to ten litres.

"We have injected into dogs of an average size up to ten litres without any accident and have not had any emphysema, either mediastinal or abdominal, as described by Achard and Binet. It is true that we always made the injections into the thoracic-abdominal region ; it appears, according to others, that emphysema occurred when the injections were made into the cervical or perineal regions. We use doses varying with the weight of the animal. To dogs of small size we give 200 to 300 c.c. and to large ones 500 to 1,000. To horses and cattle we give seven to eight litres without any accident".

"The oxygen is often absorbed in the space of twelve hours and no trace is apparent in twenty-four hours ; the absorption seems to be most rapid when the body has most need of it, as it is absorbed more rapidly in an animal suffering from asphyxia than in a healthy animal. The injections are made again as soon as absorption has taken place, on the same day if the case is very grave and in other cases on the next day, and every day thereafter until the animal has recovered. We give the injections into the lumbar region, directing the needle in the forward direction. The gas spreads into the anterior parts, the walls of the abdomen and the chest, the region of the croup, neck and shoulders. During the injection light massage assists distribution of the gas in the subcutaneous tissue. As soon as the gas penetrates the tissue you can observe near the point of the needle small enlargements which extend little by little, the parts which contain the gas sound under percussion and by pressure one can ascertain the crepitation or emphysema, thus showing where the gas is spreading."

The general action of the oxygen injected has been studied by Rapin, Beroud and Ganelon, Bayeux, Martinet and Hecket, Belin, etc., etc.

The oxygen is perfectly absorbed in the tissues within twelve to twenty-four hours following the injection, the skin which was distended by the gas is normal ; a slight crepitation exists for some hours. This is due to the presence of carbonic acid gas, which is not so easily absorbed as the oxygen. The absorption of the oxygen is more rapid if the tension is great, then there is an equilibrium between the oxygen and the gas of the plasma, then the two pressures become equal and for a time the absorption seems to be arrested, but it continues because a chemical combination takes place—the oxygen is transformed into carbonic acid, and twenty minutes after the injection one finds 5·25 per cent. of carbonic acid in the place where the injection had been made. This rapid chemical change is proof of the activity of the combustion which takes place in the whole of the injected area. The oxygen introduced under the skin collaborates well with the phenomenon of hæmatosis ; the animals which have received oxygen under the skin consume less oxygen by breathing than animals used as controls under tests, although exhaling the same quantity of $CO_2$, whether in confined air or when the air is renewed.

In a dog suffering from asphyxia the arterial blood is always richer in oxygen than in controls if it has received, before or at the beginning of the state of asphyxia, an injection of oxygen. The gas gives to the animal submitted to its action a very marked resistance to asphyxia in confined air; it survives longer than the controls. The oxygen being absorbed in the region of the pocket, provides as it were an additional lung in the subcutaneous tissue which takes up the function of the pulmonary tissue which is functioning insufficiently. But this is not all it does. It is necessary to remember, as Richet junior has pointed out, that slow poisons are evolved in asphyxia and the injected oxygen serves not only to form oxyhæmoglobin, giving life to the tissues, but it hinders or prevents their destruction by oxidising the toxic substances which the tissues form continually and in great abundance in asphyxias. Those products are responsible for a series of phenomena characterised by cerebral troubles, to which Richet gives the name of "secondary syndrome of asphyxia."

One understands thus that a small quantity of oxygen injected under the skin suffices to check the asphyxic phenomena in destroying by oxidation the poisons of asphyxia ; it is this which explains the durable action of the oxygen, for it has been observed that the asphyxic phenomena did not reappear after even a single injection of oxygen. In addition, the doses of oxygen, even if they do appear massive and frequent, are very small if one compares them with the considerable quantities normally consumed by the pulmonary apparatus.

However, there is no doubt as to the good effects of subcutaneous oxygenotherapy not only in asphyxia but also in infectious conditions where the asphyxia syndrome is of little importance. It is necessary to consider its action in such cases. Ramond and Beroud have remarked that oxygen succeeded better in cases of asphyxia where a toxic and infectious element intervened than in those where the cause was purely mechanical. The oxygen, said Ramond, possesses an energetic calming effect which helps

in the destruction of the toxins in the circulation and leads to an arrest of the morbid process. Moreover, asphyxia when it is present in infectious diseases is due to complex causes, and the disturbance or stoppage of respiratory exchanges is often under the influence of toxic infectious factors. The oxygen ought, then, to act on the infectious and toxic elements rather than on the microbe.

In a series of experiments, Belin has studied the action of oxidising substances, of which oxygen was the only active element, on the evolution of certain experimental and clinical infections. He attributes the improvements or the cures obtained to the oxidation *in vivo* of the toxins, which are rendered inoffensive.

In support of this opinion, one can cite the effective action of certain oxidising substances, *e.g.*, permanganate of potass. on the venom of vipers, and in the same way one can assume that, the toxins being rendered inactive by the oxygen, the organism can more easily free itself of the causative microbes.

It seems, according to the work of Lambling and H. Roger, that the oxidation which takes place in the lungs makes this organ one of the centres in which the destruction of toxins takes place. Domine and Bayeux have shown that, following the injections of oxygen, there is a manifest polyuria with an increase of the excretion of urea and also a diminution of the toxicity of the urine which appears seven hours after the injection, to disappear about the thirtieth hour.

It seems, then, that the antitoxic action of oxygen is as efficacious, if not more so, as its antiasphyxic action, and it also appears that the good effects of subcutaneous oxygenotherapy (attenuation or disappearance of the asphyxic or infectious phenomena) are specially due to the destruction by oxidation of the poisons of asphyxia and of microbic toxins. But this is not the limit of the action of oxygen ; it has also an action on the leucocytes—they become more active ; their amœboid movements are more complete ; they divide more rapidly ; phagocytosis is more intense and, as a consequence, there is an increase in the defensive forces of the organism in its struggle against the microbes. This action is shown by a leucocytosis in the region of an inflammatory centre when an injection of oxygen has been made there ; this leads to an attenuation of the acute condition and a rapid cure. Another important factor is the stimulating effect which oxygen has on the heart ; the rhythm is slowed and the contractions become stronger.

We have utilised oxygenotherapy in the dog in broncho-pneumonia, anæmia (associated with piroplasmosis), dysentery and uræmia. In the cow, in a case of puerpural affection associated with broncho-pneumonia. But it has been in cases of œdema of the lungs, pneumonia and broncho-pneumonia in young dogs that we have particularly observed the good effects of this treatment. It has been in those cases where the toxic element added to the mechanical troubles, or failure of the heart forms a very grave condition, that one can hope from subcutaneous injections of oxygen to obtain veritable resurrections.

The general effects of this method of treatment on similar sick animals show its efficacy. The most striking and immediate result is its action on the respiratory functions and on the cardio-vascular system, and this action is as obvious as the troubles of these organs are intense prior to injection. After the injection the dyspnœa is lessened, the respiratory movements become more full and deep, the labial whistling and the blue coloration of the mucous membranes disappear, thus showing that the patient respires much more easily. At the same time, the cardiac contractions become slower but stronger, the pulse is slower, more regular and more complete. The slowing of the respiration and the pulse are in unison ; this takes place nearly from the beginning, but does not attain its maximum until a quarter or half an hour after the injection. Sometimes, however, the improvement does not show itself for four or five hours. When the calmness does not coincide with the definite improvement, it has a duration of ten to twelve hours and does not exceed twenty-four hours. One can prolong the good effects of this therapeutic measure by renewing the injection. The patient recovers its tranquillity, sleeps often, the appetite and cheerfulness return ; at the same time, the general condition is improved—those signs are very noticeable.

One of our cases may be described, as a type showing the good effects after treatment by oxygenotherapy :—

There was brought to the school a sheep dog with all the signs of broncho-pneumonia—dyspnœa (mouth breathing, forty-eight respirations per minute), blue colour of the mucosa, abundant brown-coloured discharge, dull lung zones with crepitant râles, small rapid pulse (140 pulsations per minute) heart sounds dull and weak, temperature 40·5C.

It received 500 c.c. of oxygen into the subcutaneous tissue. Two hours later the respiratory movements became more frequent and full—rate now 29. The cyanosis disappeared, the temperature fell to 39·9°, the heart beats were stronger, the pulse was 110. The alarming symptoms reappeared the next day and for three days following, but each day after the injection we observed a diminution, more and more marked, of all the morbid signs. The patient entered into convalescence, and we sent it home two weeks later completely cured.

We possess a great number of similar observations where the evolution of the disease has been very favourably influenced and the cure rapidly obtained. The treatment has seemed more efficacious when it has been employed early. Nearly always, even in the most severe cases, an improvement is produced from the first injections. In cases where we have not been successful the animals have been brought to us when it was too late to expect a cure; even in those cases we have observed that the patients survived for several days, due, in our opinion, entirely to the oxygen. Its action is not less evident in cases of

anæmias following piroplasmosis and certain dysenteries; in such cases the number of red corpuscles per cubic m.m. has been raised from 1,000,000 to 3,000,000, after a series of eight to ten injections. It appears to us that this treatment is much more effective and quicker than iron tonics.

We think we have shown that subcutaneous oxygenotherapy is a method capable of rendering appreciable service in the treatment of a great number of affections of our domestic animals such as:—asphyxia (mechanical, traumatic, strangulation, immersion); pulmonary affections—congestion, bronchopneumonia, œdemas, pneumonia (simple or complicated), bronchitis—heart troubles, gas poisoning, etc., etc.; as an antitoxic in cases such as infectious diseases and infections following surgical operations, uræmia, diabetes, anæmia (temporary and serious); local conditions, *e.g.*, malignant pustule, gangrene, suppurating sores, etc., etc.

The injections do not present any danger (oxygen is not toxic in any dose); they can be given very easily, whether by means of costly or of simple apparatuses, they produce an immediate alleviation, they always influence favourably the evolution of the disease and procure an unhoped-for cure. By the simplicity of their application, by their innocuity and efficacy, they deserve to be very largely used, not only in states of asphyxia, but in all infectious and toxic diseases. T. D. Y.

## Tuberculin in the Prophylaxis and Treatment of Tuberculosis.*

The control of an infectious disease may be attempted in two ways: first, by exterminating the germ which causes the infection; secondly, by immunizing, or raising the resistance of, potential sufferers from the disease. In practice both methods are usually carried out in a large number of infectious diseases. Thus in typhoid fever the system of notification, isolation, and disinfection aims at destroying the bacillus, and so preventing the spread of the disease, while antityphoid inoculation is designed to prevent exposed persons from being infected. Similarly with small-pox, in which the object is to render the whole community insusceptible; but in the event of a case occurring measures are taken for stamping out the freshly introduced germ. It is, perhaps, failure to distinguish between these two processes which has prevented victory in the various crusades against tuberculosis. What are called tuberculosis schemes are mainly concerned with an attempt to exterminate the tubercle bacillus. It is not far off half a century since Koch discovered the tubercle bacillus. With the recognition of the infectiousness of tuberculosis, battalions of sanitary forces have been thrown into the attack. The main objective of all these forces has been to destroy the tubercle bacillus wherever found, or at least to confine its ravages to the infected. The ubiquity of the bacillus has stood in the way of the success of these offensive measures; and it is still possible to maintain that defensive measures of immunization are the true way to victory.

Modern procedure in dealing with tuberculosis consists in notification, sanatorium treatment, dispensary supervision, the establishment of colonies, disinfection, and the examination of contacts. Subsidiary measures are concerned with the milk and meat supply. The object of all these measures is to prevent the dissemination of the tubercle bacillus. They have had some success, but it is very far from being complete; so widespread is the disease that many doubt if it ever can be; and not a few experts in the disease hold that if the measures were successful the result would be a community intensely susceptible to chance introduction of infection. If they are correct it would follow that the only way to check the ravages of tuberculosis must be by some form of immunization, that the disease must be fought on lines similar to those which overcame small-pox, though the conditions in tuberculosis may not render necessary universal vaccination. But it seems evident that any scheme must have regard to the cure of persons already suffering from chronic tuberculosis, since they may disseminate the infection.

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### Tuberculin in Diagnosis and Treatment.

When Koch first prepared his tuberculin it was with the idea of curing actual sufferers from tuberculosis. Later its use was extended to diagnosis, especially in cattle. The unfortunate results in early days in the human being prevented its adoption as a routine means of treatment. Nevertheless, tuberculin or methods based on the theory of its action have continued to find supporters, and the possibilities of some such method as a preventive procedure should not be neglected. At present there are at least three methods of treatment in existence for definitely raising the resistance to tuberculosis: vaccination with the bacillus by the method devised by Calmette and Guerin, applicable only to the newly born; the Spahlinger method, which has attracted a great deal of public attention, but has not yet been thoroughly tested by competent and impartial observers; and the tuberculin treatment at dispensaries, advocated especially by Dr. Camac Wilkinson. There is, of course, a preventive side to tuberculosis schemes, and general public health administration, by raising the general health of the people, and presumably, therefore, their resistance to tuberculosis, by better housing, better food, and better hygiene, must have had a considerable effect. Moreover, it has within its range the examination of contacts, by which means it is hoped to detect early cases and prevent the development of the disease. But notwithstanding the undoubted value of these measures, the fact remains that in many instances, however early the disease is detected, and however thorough the hygienic measures adopted, the patient goes from bad to worse, and treatment is of no avail.

### The Scientific Aspect of Tuberculin Treatment.

We propose to state the views of Dr. Camac Wilkinson, not because we have any conclusive evidence that his treatment is of any more value than other forms of treatment, but because they form a connected and ingenious theory of the disease which, if true, should be helpful in research. Moreover, although they do not necessarily involve preventive immunization of the whole community, they contain a suggestion that prevention may be aided by rendering sufferers from the disease less dangerous than ordinary hygienic measures can make them.

According to Dr. Camac Wilkinson, acute tuberculosis occurs mainly in two classes of people—in children under two years of age, and in adults who have never been infected at all. In both cases the disease is very severe and is nearly always fatal. Very many people, however, are affected mildly, possibly through milk, after two years of age, but they have been able to overcome the disease, and they have done so by encysting the tubercle bacilli in a fibrous capsule. The process renders such persons immune to mild doses of infection, so that the majority go through life without any further manifestation of the disease. Dr. Wilkinson, we gather, holds that without this encapsuled focus there would be no immunity for them; but if by chance they meet with some massive source of infection at a time when their resisting power is lowered, they are very liable to become infected. These are the persons who provide the vast bulk of the cases of chronic pulmonary tuberculosis. Having originally had an infected focus they are comparatively immune, and do not suffer

from acute forms of the disease, but meeting a massive infection when their resistance is lowered they become chronic tuberculous cases.

Dr. Wilkinson's next proposition is that tuberculin enables a diagnosis to be made at a time when physical signs are practically absent, and also when it is still doubtful whether the case is one of acute or chronic tuberculosis. According to his view, a positive reaction to tuberculin indicates the presence of living tubercle bacilli in the body. In a patient who has reacted positively, a lessened reaction on later inoculation shows that the tissues are winning; an increased reaction indicates that the bacilli are winning. No reaction to tuberculin indicates that no bacilli are present. Consequently tuberculin, he holds, not only shows whether tubercle bacilli are present or not; it also discriminates between cases that are progressing and cases that are retrogressing, and is the only means of distinguishing the early stages of acutely fatal forms from the early stages of chronic forms of the disease. He believes, however, that tubercle bacilli cannot survive long in fibrous tissue.

### The Use of Tuberculin in Tuberculosis.

Dr. Wilkinson's next assertion is that tuberculin is the best treatment in forms of tuberculosis which are amenable to any treatment. The therapeutic effect of tuberculin, he says, is to favour fibrosis, which is the only process that can lead to anything that can be described as cure. The production of fibrosis leads to the disappearance of tubercle bacilli from the sputum; those that have not perished have become encysted, and so are rendered harmless. Consequently tuberculin treatment can be applied at a dispensary, the diseased process can be arrested in individual patients, and the bulk of them rendered free from danger to others; and the enormous costs of present tuberculosis schemes can be largely curtailed. Infectious cases are, he maintains, thus converted into non-infectious and the risk of massive infection in the family is minimized or removed.

The point in Dr. Wilkinson's thesis which may prove most difficult of acceptance is his statement that to produce immunity in tuberculosis it is necessary that a focus of the disease should exist. According to Dr. Wilkinson an infant infected under two years of age almost invariably contracts an acute tuberculosis which is fatal. But after two years of age a mild infection may be contracted, the bacilli may become encysted, and the presence of this encysted focus of the disease will render the child more or less immune, but not completely so. If the tubercle bacilli, says Dr. Wilkinson, are destroyed in the focus, as probably often happens, especially in the primary stage, the immunity slowly disappears and reinfection may occur, but not in an acute form. In these cases in middle life a massive infection may overcome such immunity as remains, and the patient may become an example of the common form of chronic pulmonary tuberculosis. It appears, therefore, that in Dr. Wilkinson's opinion a mild infection after two years of age may either be completely cured or may leave a fibrous encysted focus. In either case the patient is fairly well protected from acute forms of tuberculosis; but in both he is susceptible to the chronic form of the disease if exposed to massive infection. The completely healed person will not react to tuberculin, while a reaction is obtained whenever an encysted focus is present.

Dr. Wilkinson regards the disuse of tuberculin in the cure of the disease as due to errors in its administration. He asserts that he has never seen any harm caused by tuberculin when properly administered; and, as we have indicated, he regards it as by far the best and least costly treatment. Dr. Wilkinson's method of treating his patients is to begin by injecting a dose—generally 0.0002 c.cm. of T.A.F. or T.A.—for diagnostic purposes. Any rise of temperature to 100°F. or over, coupled with a skin reaction and other special symptoms following the dose, is regarded as conclusive of the existence of living tubercle bacilli in the body. If the temperature rises to less than 100°F. further diagnostic doses of 0.001 c.cm., 0.005 c.cm., and 0.01 c.cm. are given. Dr. Wilkinson asserts that in thirty years' constant use of tuberculin he has never seen a bad effect from one or several test doses. On many occasions, on the other hand, he has been able to prove the existence of tuberculosis in people who had been regarded as free from the disease; while in others a previous diagnosis of tubercle has been shown to be erroneous.

When satisfied that the diagnosis of tuberculosis is correct, Dr. Wilkinson proceeds to treat the patient with tuberculin, beginning with quite small doses, increased at intervals of four to six days, until as much as 1 or 2 c.cm. are injected. The speed with which the dose is increased depends upon the reaction shown by the patient, who is taught to keep a record of his own temperature. The patient's weight, to increase of which Dr. Wilkinson attaches great importance, is recorded at each visit to the dispensary. After a course of treatment, lasting some months, patients are advised to present themselves a year later for further test doses.

### What is Immunity to Tuberculosis?

It is not, however, with Dr. Wilkinson's claims to successful treatment of individual sufferers from tuberculosis that we are most concerned. Such claims are made by everyone who treats tuberculosis, yet tuberclosis persists. The questions which seem to be of importance are: First, does tuberculin cause fibrosis, and thereby shut off foci of infection? Secondly, if so, does it produce results sufficiently effective to render unnecessary some of the costly tuberculosis schemes? Thirdly, to what extent can its use be described as preventive? We gather that no claim is made that tuberculin can be used as a vaccine for immunization against tuberculosis comparable to the vaccination by attenuated living bacilli, for which good results in infants are claimed by Calmette. It appears, however, to be a fact that tuberculin is used in treatment, even in some sanatoriums; it seems to be very difficult to obtain definite statements as to the results; and it is clear that the questions we have asked can only be answered after proper investigation. In 1920 the Medical Research Council was asked by the Ministry of Health to investigate the claims made by Dr. Wilkinson, and Drs. G. T. Western, L. S. T. Burrell, and A. S. MacNalty were entrusted with the task. The report of these observers was at first regarded as confidential. But in the summer of 1923 Dr. Wilkinson published a pamphlet, entitled *The Tuberculin Dispensary for the Poor*, in which he criticized the report severely, and complained that the observers had made serious misstatements about his treatment, and had not given sufficient time to the investigation of his methods and his cases. In reply to this pamphlet the report was published in full in the *Lancet* on November 3rd, 1923.

In matters of scientific interest, especially in those which may have large public importance, it is unfortunate should prejudice or intolerance of criticism be allowed to affect the issue. The main conclusion of the observers was that "the method of tuberculin administration advocated by the Tuberculin Dispensary League does not appear to have claims over other methods of treating tuberculosis, either with or without tuberculin, which would justify its general adoption." There is no reason to doubt that the observers arrived at this conclusion after due deliberation on the material offered to them; and, from the point of view from which they investigated, it is quite possible that the conclusion was legitimate. What may be doubted is whether the observers had in mind the object which, perhaps, is alone of any real value to public health.

Let us briefly recapitulate the argument. All tuberculosis schemes are more or less ineffective in exterminating tubercle. We have ventured to suggest that in most schemes the objectives of extermination and immunization are not clearly distinguished. Among the schemes having an immunizing objective may be placed Dr. Wilkinson's. He alleges that large numbers of people are immunized in childhood, probably by bovine infection. This immunity is liable to break down later on when a patient is exposed to massive infection. If this occurs he proposes again to

close the open tuberculosis by means of tuberculin, which promotes fibrosis. In doing so he asserts that he renders the patient less liable to infect others. The observers from the Medical Research Council appear to have confined their attention solely to the percentage of cures obtained by Dr. Wilkinson's treatment. They do not seem to have made any criticism of the scientific value of Dr. Wilkinson's views; and they made no comparative estimation of the merits and costs of the treatment. They found that the percentage of cures was no larger than that obtained by other forms of treatment. The question at once leaps to the mind, if the cures are the same and the costs to the community and also to the individual are less, what reasons are there for preferring the more expensive treatments to the cheaper? The observers do not answer this question, unless it is by leaving us to infer that tuberculin as administered by Dr. Wilkinson appeared to them to be useless, although they do not go so far as to say so. Indeed, they cannot have come quite to this conclusion, since they state that occasionally individual cases seems to derive distinct benefit from tuberculin treatment. They found that Dr. Wilkinson succeeded in immunizing his patients to large doses of tuberculin, but that there was no evidence that he immunized them to tuberculosis. Yet in the next paragraph, referring to patients who had had "hygienic" treatment as well as tuberculin, they say that early recognition and putting the patients under hygienic conditions rank as *equal* with, or as more important factors than, tuberculin in the arrest of the disease. We have confessed that we had no evidence that Dr. Camac Wilkinson's tuberculin treatment is of any more value than other forms of treatment in individual cases of tuberculosis. What we cannot gather from the report of the Medical Research Council's observers is whether it is of less, or no, value. Above all we find in that report no definite challenge to the views on tuberculosis held by Dr. Wilkinson.

Seeing that offers of assistance have been made to M. Spahlinger for the purpose of testing his views, which, so far as we understand them, have a certain general resemblance to those of Dr. Wilkinson, we think it would be justifiable to ask the Medical Research Council or the Ministry of Health to undertake further investigation of the tuberculin dispensary treatment, especially in its scientific aspect. The questions to which answers might be sought are: Is it true that tuberculin as administered by Dr. Wilkinson produces no ill effects? Does tuberculin cause fibrosis around tuberculous foci? If so, can the effect be produced in a sufficient number of patients to lessen the dangers of infection to others? Is tuberculin of use for diagnosis in the human being? If the answer to these questions is in the affirmative the final question is whether the use of the treatment is sufficiently effective to relieve the country of some of its burdensome expenditure on tuberculosis. If the answer to the questions is negative, the tuberculin dispensary patients might profitably be directed to other forms of treatment.

## The Chemistry of Bush Sickness, or Iron Starvation, in Ruminants.*

By B. C. Aston, F.I.C., F.N.Z.Inst.

(Abstract.)

In 1911 the writer published (*Trans. N.Z. Inst.*, vol. 44, p. 288) some preliminary results of his work on bush sickness, a wasting, non-transmissible disease in ruminants, characterized by excessive anæmia, which ultimately proves fatal if the animal be not removed to healthy country. The disease occurs over a large area of country in the thermal district of the North Island. The iron-starvation theory was first published as an hypothesis by the writer in the August, 1912, *Journal of the Department of Agriculture*, p. 124. Since then the work has been continued, the evidence becoming stronger every year, until now it is thought that iron deficiency as a causative agent has been fully proved. (See the series of articles, *Journ. Dept. of Agric.*, April to August, 1924.) The matter is of great economic importance, as not only is the area affected very large (at least a million acres, and probably much more, being affected), but doubts are cast on all pumice lands, the settlement of which is thereby retarded. The soil in the affected area is always derived from an air-borne coarse pumice several feet in depth, resting on rhyolitic country rock. Apparently pumice soils which have been sorted out, compacted, and weathered by water are not bushsick, since river-terraces and lake-terraces, unless overlain by recent aerial deposits, are free from the disease. Topographical and soil surveys, which are now being carried out, may be expected to throw considerable light on the distribution of bush sickness. The analysis of the blood of sick animals published in 1911 showed a great deficiency of iron, although the grass-ash failed to show any such deficiency. Grass is, however, easily contaminated by soil, and this pumice soil would yield about ten times more iron to the hydrochloric acid than would the grass-ash. Hence, unless special pains are taken to guard against the entry of this impurity into the samples, unreliable results are obtained. Similarly, pumice soils are entirely abnormal in mechanical composition, the particles consisting of an easily broken solidified froth. This cannot be analysed by the standard methods in use for determining the mechanical composition of ordinary soil. If such methods are used they give unreliable results, the finer fractions tending to become higher in quantity owing to the breaking-down of the particles in the course of preparing the sample for the analysis. The clue afforded by the analysis of blood, suggesting the deficiency of iron, has been followed up in the work undertaken by the Department in the Dominion Laboratory and in the field during the past fourteen years. Areas have been leased and field experiments conducted thereon. Finally, a demonstration farm was purchased at Mamaku, in the heart of the bush-sick country, in an endeavour to learn a practicable method of farming this type of land without periodically changing the stock to healthy country, as is the practice at present. This country is more adapted to cattle than to sheep farming, and, could a practicable remedy be discovered, a great area would be available for dairy-farming.

The chemical part of the work, which has been under the immediate direction of the writer, comprises the analysis of soils, fodder plants, and animal specimens, and these have not shown the presence of any known poison. The absence of poison is, however, indicated by certain facts. Horses may be kept in perfect health for many years upon the same pasture on which ruminants would die in three to nine months, sheep being most and cattle least susceptible. Ruminants, however, when given turnips and hay made from the bush-sick pasture, can be kept healthy while still grazing on the same pasture which as a sole ration would bring on bush sickness. Molasses, bran, and other imported concentrated foodstuffs added in small quantity to the natural ration enable an amimal to be kept healthy on the bush-sickness-inducing pasture which, if it contained a poison, would undoubtedly continue to exert its deleterious effects. Again, when an animal at the onset of the sickness has been sent away for a change to healthy country, and after a few months it returns in poor store condition to the pasture upon which it was becoming sick, it fattens or improves greatly in condition. These facts alone, the writer considers, are sufficient to disprove the possibility of poison being present in the natural fodder—cocksfoot-grass and clovers. The author considers that there can be no other explanation of the cause of bush sickness but that which postulates a deficient food-ingredient. It is not to be thought that the organic nutrients are deficient; grasses and clovers grow particularly well on these pumice lands, and provide an ample organic ration. It must therefore be in the mineral or inorganic portion where one must search for the deficient ingredient of the elements necessary to maintain animal life—calcium, phosphorus, potassium, sodium, magnesium,

*Reprinted from *The Transactions of the New Zealand Institute*, Vol.55, pp. 720—723.

chlorine, iron, and sulphur, named in the relative order in which they occur in the animal's ashes. Iron is the only element about which there can be any doubt as to its presence in sufficient quantity. Phosphorus, although often deficient in the soil, is obviously not low enough to produce nutrition disease in the animal. Phosphorus is stored in the bone of the animal; bush-sick animals show no disease of the bones or other symptoms usually manifested by deficient phosphorus-supply in the diet. Moreover, administration of phosphates to the animal, either medicinally or through the pasture, does not enable them to be kept permanently free from bush sickness. There may be other elements which are required in very small quantities, such as fluorine and iodine. Nothing is known of the exact need for the former, which must be required only in very small amounts, and the latter has been administered to a sick beast without effecting any improvement. Bush sickness occurs in coastal districts where sulphur is not likely to be wanting. Thus by a process of elimination one naturally arrives at iron as being the deficient element. Of the igneous rocks, the rhyolites, from which the bush-sick soils are derived, are among those rocks which contain least iron. The rhyolitic froth—pumice—which forms the soils, had no doubt been leached before being redistributed by a series of explosions in geological time, long after its formation in the volcano. This redistribution took place, according to Thomas,* not long before the Maori came to New Zealand, which would be probably about a thousand years ago.

The amounts of iron extracted by hydrochloric acid from these pumice soils is of the order of 1 per cent., but the amount extracted in Dyer's 1-per-cent. citric-acid method for "available plant-food" gives about 0·03 to 0·07 per cent. iron, whereas on non-bush-sick pumice soils the amount rises from 0·07 to 0·1 per cent., and on non-pumice soils it may rise to 0·3 per cent. These amounts for iron, compared with the standard amounts required for other constituents—phosphoric acid and potash—in the Dyer method, are high, but the standard for iron may need to be a high one. Another remarkable fact is that when bush-sick pasture is top-dressed with lime the animals become bush-sick sooner than on land which has had no treatment. This may be connected with the well-known fact that chlorosis of plants often occurs on sandy land containing an excess of lime.

It is when one comes to the analysis of fodder plants that the first good evidence of iron deficiency is obtained. Pfeffer (*Physiology of Plants*, p. 428) states that ordinary plants are fully supplied with iron when 0·2 per cent. is present in the ash; but he is no doubt looking at the matter from the plant's point of view, and not from that of the animal which has to subsist on the plant. Analysis of the fodder plants, grasses, and clovers from the bush-sick country show that the iron content of the ash may sink to 0·05 per cent. Although the plant apparently continues to be healthy with this small amount of iron, it may not be sufficient for the animal. The analyses of clovers and grasses of the sick show that the iron content is very much lower than that of the similar plants growing on healthy country. Recent work by Dr. Orr, the Director of the Rowett Institute, Aberdeen, and his associates, has directed attention to the importance of inorganic foods in animal nutrition. An account is given of iron starvation occurring in pigs, when the mother was fed on a fish and vegetable diet containing 1,068 milligrams of food iron per day. It is suggested that the mineral-food requirement of each species of animal may be indicated by the composition of the milk of the species. The faster an animal grows, the more mineral food it requires. A young pig doubles its weight in ten days, but a calf takes forty-seven, a colt sixty, and a human child 180 days. Human milk and mares' milk contain one part, cows' two parts, and pigs' nine parts of iron in equal portions of milk. It is suggested by Kellner that an animal requires two or three times the amount of mineral food that it is able to store up. Sherman lays down the dictum that 12 milligrams of iron per day should be sufficient for an adult human being. Using this *data* and applying the corrections necessary—*i.e.*, (*a*) for the increased weight of the species, (*b*) for the increased amount of iron required as shown by the iron content of the milk of the species, (*c*) for the allowance suggested by Kellner for phosphoric acid and lime (two to three times the amount which is present) and assuming that the same holds good for iron, one arrives at the conclusion that if the pasture contains only 0·0025 per cent. of iron, and a cow eats 100 lb. per day, there is good reason to suppose that 1,132 milligrams of iron per day is insufficient for the animal's requirements. A horse, which grows only at one-sixth the rate of a sheep, and the milk of a mare containing only one-ninth of the iron found in sheep's milk, may similarly be shown to be sufficiently supplied with iron from a pasture upon which cows and sheep suffer from iron starvation. Analyses of pasture-plants grown in pots and in the field establish the fact that the iron content of the portion grown in spring and early summer is much lower than that of the portion found in autumn. It is in the spring and early summer that bush sickness is prevalent.

Finally, numerous and long-continued feeding experiments on cattle, and medicinal treatments, have demonstrated conclusively that, although many substances may alleviate or postpone the onset of symptoms of bush sickness, there is only one which will bring an animal back to health when badly affected, the food being unchanged. That substance is a soluble salt of iron, the best of all for the purpose being the double citrate of iron and ammonium, the ferri ammon. cit. of the druggist.

It is to be regretted that the exact iron requirement of ruminants is unknown. The conjectures which are here made as to the requirements are introduced to complete the chain of evidence and to show that iron starvation on green pasture may not be impossible. The main portion of the proof must rest on the evidence supplied by the analysis of the pasture, the soil, and the animal, compared with normal specimens; the medicinal means by which the animal may be restored to health; the manurial means by which the pasture may be rendered capable of growing healthy animals; and, lastly, by the symptoms exhibited by the sick and dead animals to prove that bush sickness is really iron starvation.

There is reason to believe that bush sickness exists in parts of the Dominion other than in those on the pumice lands, but always on a soil of loose sandy nature, or derived from an acidic igneous rock of low iron content. In these cases, owing to the proximity of soil and pasture of higher iron content, and the feeding of supplementary fodder crops in winter, the effects are not likely to be so serious as in those pumice lands where these conditions do not obtain. Further, in at least three widely separated countries outside New Zealand a nutrition disease exactly similar to bush sickness develops, and the writer predicts that it will be found that the cause is in each case the same—*viz.*, iron starvation. These external areas are—(1) In King Island, off the coast of Tasmania, in sandy soil, where the disease is known as "coast disease"; (2) in the Kedong Valley, Nairobi, British East Africa, on a grey volcanic ash, where a wasting disease occurs in cattle; (3) in North Britain, in the Cheviots, and in various parts where a disease in sheep known as "pining," "vinquish," or "daising," occurs on soil derived from porphyritic rock.

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R.C.V.S. Library. The following books have been added to the Library during the past fortnight: Maxwell, "Handbook of Meat Regulations"; Calmette, "Technique de Microbiologie et Serologie"; Herbst, "Tierzuchtlehre"; Reinhardt, "Lehrbuch der Geflügelkrankheiten."

Books may be borrowed from the Library by members of the College on payment of postage both ways. Apply to the Librarian, 10 Red Lion Square, London, W.C.1.

**The Veterinary Record.**
*12th March, 1927.*

## THE OUTCOME OF FOOT-AND-MOUTH DISEASE RESEARCH.

Research workers in epizootiology have still to confess that the virus causing foot-and-mouth disease remains a hidden mystery. The hope of 1924, when Dahmen and Frosch launched their "discovery" on the world, has proved abortive, and we are left precisely in the same position now as we were before Dahmen and Frosch published their views. The virus of foot-and-mouth disease can neither be seen by any microscopic or photographic means, nor can it be propagated outside the body of an infected animal. That its discovery will be declared some day no doubt is certain, but until such a red letter day arrives, we have to put up with recognition by the effect it produces in susceptible animals, and to frame our methods of combat accordingly. We are therefore forced into the position of empiricists in relation to the disease. However, if cause is not apparent, effects can be turned to great purpose in framing plans for attack. We publish this week a review of the Second Progress Report of the Foot-and-Mouth Disease Research Committee which was set up in 1924" to initiate, direct, and conduct investigations into foot-and-mouth disease, either in this country or elsewhere, with a view of discovering means whereby the invasions of the disease may be rendered less harmful to agriculture."

We also draw particular attention to the statement of Lord Bledisloe on the order for the second reading of the Diseases of Animals Bill in the House of Lords on February 24th, published in last week's issue of the *Veterinary Record*, and especially to that portion of it which has reference to the activities of the Foot-and-Mouth Disease Research Committee, and the remarkable results of a policy which the investigations of research workers have suggested. If ever there was justification, in the first instance, for the slaughter policy adopted by this country, the figures quoted by Lord Bledisloe prove it, and the same and subsequent figures of relative incidence of foot-and-mouth disease on the Continent and in Great Britain will support the wisdom of the prohibition of the importation of carcases from the Continental sources, a restriction which is based on most valuable investigation of the workers of the Research Committee. The discovery of the viability of the virus of foot-and-mouth disease for as long a period as 76 days in the bone marrow of infected carcases is an issue of research which, we venture to say, represents a saving to the State far exceeding the cost of the Commission, and certainly justifies all possible support and encouragement to that body of workers who are giving the best of their able service in the difficult task which they have undertaken. We wish them continued success. A practically open field is still before them, and there are possibilities of further discovery which bring their own reward.

## REVIEWS.

### Second Progress Report of the Foot-and-Mouth Disease Research Committee.

The Second Progress Report of the Foot-and-Mouth Research Committee is now published, and is available for purchase at any of His Majesty's Stationery Offices at the cost of 3s. 6d.. Though the causal agent of the disease still holds the field in discovery, and may be recognised only by its effects on susceptible animals, the work of the investigators is nevertheless to be very highly appreciated. Facts which they have brought to light in connection with the disease are of the greatest epizootological importance, powerfully aiding measures of control. Knowledge of this particular filter-passing virus has been considerably extended, the susceptibility of various small animals which might contribute to spread of the disease has been explored, some of the conditions under which the virus may survive upon inanimate objects, fodder and carcases have been defined, and the susceptibility of the virus to various chemical substances which may practically be employed as disinfectants has been closely studied and recorded. Lastly, their observations on natural and acquired immunity to the disease are encouraging in the quest of means for the protection of farm animals.

Unfortunately, during the past year the Committee has lost by death two of its valuable and experienced members in Sir William Leishman, Chairman of the Committee, and Sir Stewart Stockman. Professor C. J. Martin, of the Lister Institute, has been appointed Chairman of the Committee, and Mr. J. R. Jackson, now Chief Veterinary Officer of the Ministry of Agriculture, has been appointed to the vacancy caused by the death of Sir Stewart Stockman. Though not mentioned in the Report, it is understood that the Committee has been strengthened by the inclusion of Dr. Andrews, the Director of the Ministry's Veterinary Laboratory, Weybridge. Also, in addition to the Ministry's Laboratory, Weybridge, the Experimental Station, Pirbright, the Lister Institute, London, and the Liverpool University, the National Institute for Medical Research, Hampstead, by arrangement with the Medical Research Council, will aid in the investigations. The Report broadly deals with the Research work under the following headings, and it is convenient, therefore, to take the same headings for purposes of brief review, or extract:—

A. Study of the virus.
B. Plurality of types of virus.
C. Experimental infection of animals not readily susceptible to the disease.
D. Characters of the disease induced in farm animals by experimental inoculation.
E. Cross infection experiments between cattle and guinea-pigs.
F. Immunity.

A.—In commenting on the further attempts to cultivate the virus *in vitro* (*i.e.* outside the body of infected animals) and with special reference to the alleged discovery of Dahmen and Frosch in 1924, the Committee states that "None of these apparently successful efforts to cultivate the virus, made either in this country or elsewhere, could, however, be repeated at will, and it seems probable that most of them can be best explained by survival rather than by multiplication of the virus." Prolonged attempts to cultivate the virus on a number of different artificial media were continued at both the Ministry's Laboratory and the Lister Institute, both in the presence of air and with the exclusion of air, but in no case was any success attained. It was, however, found that the virus survived longer in media containing pieces of animal and vegetable tissue. The bacteriologists working for the Committee also could not confirm the claims of Titze (1922) and Pfeiler (1924) that they had propagated the virus in liquid culture media, nor the statement of the former that he had been able to produce immunity to foot-and-mouth disease by inoculating his cultures. Until the virus can be propagated on artificial media, material for experimentation must be derived from affected animals. By repeated passage through guinea-pigs a virus of high potency can be obtained and maintained for long periods. Vesicular fluid may be diluted as much as 1 in 2 million and still retain its infectivity for guinea-pigs. Samples of dilution up to 1 in 10 million have even been proved infective for these animals. The blood of guinea-pigs is not usually infective for these animals in dilutions higher than 1 in 1,000. Vallée and other workers suggest that the blood of cattle in the early stage of the disease furnishes a reliable and relatively abundant supply. Failing the discovery of the actual causative agent of the disease, the great importance of ascertaining facts concerning its resistance under adverse conditions such as might influence incidence of the disease among farm animals, has deeply engaged the very detailed attention of the research workers, and their findings are most valuable in explanation of certain outbreaks in this country, and in aid of measures of control. Experimenting on viability under circumstances or conditions approximating those commonly incident to outbreaks, and using vesicular fluid unfiltered but diluted 1 in 5, it was found that on drying on paper in the air of the room at ordinary temperatures the virus was inactive after six to nine days; on silk fabric after 14 days; on woollen fabric after 21 days; on hay the virus was active after from eight to fifteen weeks; on bran it was active after from eight to twenty weeks; on flour after seven weeks but not after twelve weeks, on cow's hair it was inactive after six weeks; on sand after three weeks; and mixed with salt butter it was active after two weeks but not after three weeks. With blood, in which the virus is 1,000 times less concentrated than in vesicle fluid, viability is placed at four days, at the outside on fabrics, but on hay the virus was active after twenty-one days. A direct experiment was made at Pirbright by feeding with hay purposely infected, and the disease was contracted after storage of twenty-eight days, but not beyond that period.

It is, however, in relation to viability of the virus in carcases that the outstanding merit of the work of the researchers is shown, and which has thrown quite a new light in matters of control. The findings of the Committee are so important that they are quoted in full:—

"7.—*Survival of virus in carcases of infected guinea-pigs.*—The survival of virus in dead animals has for some time been under examination in the Ministry's Laboratory, and it has been shown that tissues from the bodies of guinea-pigs killed when the blood is infective, may remain infective for a considerable time in cold store. All the carcases stored were skinned and eviscerated; some of the animals had been bled and some not. In two carcases of animals which had not been bled, the blood was infective after thirty-six days and in one of these the bone marrow was infective up to the ninety-sixth day. In the carcase of an animal which had been bled the bone marrow was infective for at least thirty-six days. Epithelium from the lesions was infective after 102 days.

"Similar experiments on the survival of virus in guinea-pig carcases have been made at the Lister Institute, and the persistence of the virus in the bone marrow confirmed."

"8.—*Survival of virus in carcases of cattle and pigs.*—The fact that the virus may persist so long a time in the tissues of small animals kept in cold storage, has an obvious significance. Experiments have, therefore, been undertaken at the Ministry's Laboratory to determine for how long the virus may be recovered from:—

"(1) The carcases of cattle and pigs which have been slaughtered in the early stages of foot-and-mouth disease, dressed for market and either chilled or frozen.

"(2) In the carcases of pigs when dry and wet salted.

"As was to be expected, the virus was not recoverable from flesh after *rigor mortis*, and its accompanying considerable development of acidity, had occurred. The blood, however, whether the carcases were frozen or chilled, was infective for 30 to 40 days, and the bone marrow for still longer periods: in two instances for 76 days. After dry and wet salting, the virus was recovered from the bone marrow after 42 days.

"The disease was readily conveyed to pigs by feeding them on crushed bones from the frozen carcases containing infected marrow.

"Imported carcases of pigs with lesions of foot-and-mouth disease on them were proved to contain the virus by experimental infection of cattle at Pirbright with material from the foot lesions.

"Survival of the virus in carcases buried with and without lime has also been investigated, as well as the effect on the virus of pickling in brine the pads of guinea-pigs, feet with lesions upon them. Burial of the carcases with lime did not shorten the period of infectivity. In some of the brine-mixtures ordinarily used by the trade, the virus was not recovered from the feet after five days, but in others it was present after a month."

The effect of some chemical agents on the virus is most interesting and instructive, not only from the point of view of preparing an innocuous but effective "vaccine," but from that of disinfection. Its resistance to alcohol, to chloroform, and to glycerine is extraordinary. Samples of vesicle fluid in fifty per cent. glycerine have remained active for over 400 days and in ninety-six per cent. glycerine for ten months. The virus resists the action of sodium fluoride, phenol, toluol, lysol, hydrogen peroxide, chlorine, iodine, chloropicrin and acetone in concentrations which rapidly destroy ordinary bacteria. Metallic salts were much more effective—mercuric chloride at 0·4 per cent. copper sulphate, zinc chloride and sodium acid sulphate each at one per cent. being specially mentioned. The resistance to formalin was tested with special care as it entered into the preparation of a formalised vaccine.

B.—The Committee absolutely confirms the view of Professor Vallée and Carré as to the existence of two types of foot-and-mouth disease, designated by Vallée as "O" and "A." "A" is much less common than "O" in Great Britain and in France, and neither confers immunity against the other. Confirmation of the distinction was aptly illustrated on four occasions of accidental infection at Pirbright. So far, no evidence of the existence of more than these two types has been obtained in this country, but Waldmann in Germany has described three types.

C.—To clear up occasions of unexplained spread of infection where animals other than farm stock might possibly be blamed, attempts have been made to infect rats, rabbits, dogs, cats, hedgehogs and birds, and to study any relation they may have on incidence. The results of the experiments on rodents other than guinea-pigs is to show that these animals can be infected by inoculation, but the disease hardly ever passes from one to the other by natural means. Neither dogs nor cats were readily infected by inoculation, but cats appear to be more susceptible than dogs: no infection as the result of contact was observed. Two hedgehogs appeared

to be readily infected by inoculation, but no mouth lesions were observed. No evidence of infection resulted in the inoculation of thirty-four fowls, ten house martins, and six house sparrows.

D.—In seventy-one oxen inoculated, mouth and feet lesions resulted in sixty-three cases and in eight on feet only. In sheep, lesions were insignificant, and out of thirty-nine infected only two showed mouth lesions. In pigs, eleven out of fifteen had mouth lesions and all had feet lesions.

E.—Only once did cross infection from guinea-pig to cattle result, and never from infected cattle to guinea-pigs.

F.—With a view to finding a satisfactory way of protecting farm animals from infection, much study of artificially-produced immunity in guinea-pigs has been undertaken during the year. A practical issue, however, would not appear to be as yet in sight. After an attack guinea-pigs remain resistant for a variable period, usually from three to four months. The duration of acquired immunity in cattle is being tested at Pirbright. So far, resistance to an intra-muscular inoculation has been found at thirteen-and-a-half months after an attack. Partial immunity is easily produced, but unless immunity is complete and reasonably durable, it carries no advantage. Results are stated to be distinctly hopeful with formalised vaccine, but that the best technique of preparing and using a dead vaccine has probably not yet been found. "Whether a formalised vaccine prepared from guinea-pig virus can protect cattle against natural infection with foot and-mouth disease virus by feeding or contact is being tested in this country." At Pirbright Experimental Station the simultaneous inoculation of serum and virus after the manner adopted to protect cattle from rinderpest and as practised in Germany for foot-and-mouth disease, has been tried in six cattle, the animals proving to be immune 116 days' later. The Committee has also experiments in train in which protective serum from recovered and hyper-immunised animals is employed and the possible improvement of methods for its evaluation. Investigations under the heading of immunity present many difficulties and sets back, but it is hoped that the good work embarked on will some day show a fruitful issue. J.M.

## Report of the Medical Research Council for the Year 1925-1926.*

To read through the 12th Annual Report of the Medical Research Council for the year 1925-1926 would convey, even to the layman, a wonderful idea of the importance and wide scope of the work undertaken.

The report of the Committee of the Privy Council for Medical Research, which precedes the report of the M.R.C., is interesting. We note with pleasure that our colonies and dominions are in future to be represented on the Committee, and that the M.R.C. has been brought into close relationship in its work with many other departments, both civil and military.

The apparent delay between discoveries and their practical application has lately been more noticeable, the reason given being the increase in the resources and organisation of the different parts of the government machinery. We applaud the cause, and no doubt these delays will be soon remedied.

It is also pleasing to note that no less than £135,000 was provided by Parliament during the financial year. Government recognition, in such a substantial manner, is a good augury and gives us, of the veterinary profession, the hope that in the near future we may be similarly recognised.

The clinical side has not been neglected and grants have been made for research in clinical medicine at many centres. This report ends by saying that: "Recent events are welcome as indicating an increasing recognition of the essential part that science and the work of scientific discovery has to play in the varied life and development of the British commonwealth of nations." With this view we concur—science has been neglected too long.

The report of the proceedings of the Medical Research Council is a highly technical production and one which loses very little of its impressiveness by being brief. The Council point out that there is a potentially rich supply of investigators of the first order in this country, and draw attention to the urgent need for an improvement in the rewards and conditions of work, without which the recruitment of the best brains to this high type of national service is not likely to be effectually secured. The solutions of many urgent problems in the medical field are delayed by a shortage of the most competent men.

Scientific men should not be charged with the duty of promoting definitely utilitarian ends in their expenditure of public money. The investigator should be as free as possible of such restrictions—the most competent worker cannot know beforehand whether or not any given piece of knowledge is destined to be practically useful.

The practical utility of research can only be attained by close co-operation between laboratory and clinical workers.

### Tuberculin.

The Tuberculin Sub-Committee have continued their studies of the double-intradermal test in cattle, and the results obtained have confirmed the Committee's favourable opinion of the test and of its superiority over the subcutaneous test.

Veterinary surgeons and stockowners find this test simpler and more satisfactory than the subcutaneous, and the Committee are gratified to find that the test is being increasingly used by veterinary surgeons. The Committee consider that the ophthalmic test should only be regarded as a subsidiary or confirmatory test. There is reason to believe that certain brands of ophthalmic tuberculin may give non-specific reactions after repeated tests, especially subcutaneous tests.

The Committee has been consulted by the Ministry of Health upon the tests to be exacted for herds producing certified milk. A series of investigations is being conducted with reference to the standardisation of tuberculin.

### Treatment of Tuberculosis.

It has been shown by Prof. S. L. Cummins that in rabbits mild infections of tuberculosis can be practically eliminated by the use of "Sanocrysin," the factors of importance being the dosage and virulence of the strain of T.B. used. Capt. Douglas' results show, however, that Sanocrysin has no specific action on the tuberculosis bacillus. It affects the cells and so indirectly damages the infective organisms.

Dr. J. W. S. Blacklock has done some work in the distribution of bovine and human types of T.B. in hospital patients. Results show 90 per cent. of pulmonary cases to be of the human type, while 70 per cent. of tuberculosis of the bones, glands, and abdominal organs are due to bovine T.B. infection.

### Canine Distemper.

Investigations have been continued by Dr. P. P. Laidlaw and Mr. G. W. Dunkin.

They have been able to immunise ferrets by means of inoculation with a virus killed or inactivated by formalin. Ferrets are highly susceptible, but animals so treated are usually able to withstand large doses of fresh virus, which would otherwise have proved certainly fatal, without acquiring the disease or showing notable disturbance. Weakened virus has been found to give only temporary immunity to dogs.

Dogs show a capricious variation in their susceptibility to the disease. Vaccination favourably modifies the course of the artificially produced disease in dogs, and it is hoped to produce a practical method of protective immunisation by artificially inducing a mild attack of the disease

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in animals temporarily protected by vaccination with weakened or dead virus.

They have been able amply to confirm Carré's view that distemper in dogs is caused by a filter-passing virus.

The investigators have been able to observe the course of the disease when uncomplicated by secondary infections and have so been able to clear up many of its obscurities.

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Dr. A. S. Parkes has shown that the œstrus-producing hormone is not confined to the ovarian follicle. It can be extracted in equivalent amounts from the stroma of the ovary. Injection during the early stages of pregnancy invariably causes œstrus and the termination of pregnancy.

Œstrus can be produced during lactation by the injection of sufficient amounts of hormone.

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Prof. Korenchevsky has shown that the thyroid gland influences body temperature. Its influence depends on the power of its hormones to increase the chemical changes of the body and consequently heat production.

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Experiments indicate that in Jensen's rat sarcoma the injection of protein fractions precipitated from tumour extracts increases the rate of growth of the sarcoma.

The report concludes with a statement as to the alterations in the composition of the Council, and an expression of indebtedness to the numerous men of science who have given so freely of their time.

J. McC.

## Centralised Cremation of Anthrax Carcases.

The serious outbreaks of anthrax in Forfarshire during the past few years were commented upon at a meeting in Forfar of the local authority under the Contagious Diseases (Animals) Acts, and the proposed establishment of a crematorium in a central part of the county, to which carcases of animals infected with anthrax could be removed, was considered.

The Chairman, who outlined the principles of the new system, and who said, at the outset, that the number of anthrax cases in the county was becoming very serious, stated that under the new system the carcase of the animal would be removed in a special galvanised iron box, which would be sent out on a motor lorry. The carcase would thereafter be taken and put through a digester containing superheated steam. Everything would be finally reduced to a powder.

It was explained that the system, which was in use in Lanarkshire, did not eliminate handling altogether, but at the police stations rubber gloves would be obtainable. With regard to the cost of the system, it was stated that the cost of removing each carcase and destroying it would be £2 10s. That was if the case occurred within a 20-mile radius. The total cost of destroying the carcases last year, under the present system, was, on an average £2 2s. 8d. for each carcase. But that figure did not take into account the expenses of the police, etc.

An offer had been made by a Motherwell firm to supply a mild steel digester, 4ft. 6in. in diameter and 5ft. 6in. deep.

The opinion was expressed by some of the members that a digester of these dimensions might be small enough to deal with the class of cattle in Forfarshire.

Dr. Sinclair, County Medical Officer, said that the only certain way of killing anthrax bacilli was by actual flame.

On the motion of Mr. T. Edwards, it was decided that a deputation, consisting of the Chairman, the Chief Constable, the Veterinary Inspector, and Dr. Sinclair, should go to Lanarkshire in order to study the system in working order there. The deputation would gather as much information as it could and report to the local authority. It was also decided that the County Clerk should take up the matter with the knackery people, and should also go into the question of a portable furnace.—*Dundee Courier.*

# CLINICAL AND CASE REPORTS.

## Notes on Specimens Exhibited at the Annual Meeting of the Scottish Metropolitan Division.

By Professor W. M. Mitchell, M.C., B.Sc., M.R.C.V.S., Edinburgh.

1. Myxo-chondro-sarcoma of the Femur, Dog.

This specimen showed a tumour growing from the proximal extremity of the femur of a Labrador Retriever, involving the cancellous bone, and infiltrating the upper part of the quadriceps group of muscles. The hip joint was not affected.

Professor Matheson's report on the nature of the new growth was "Myxo-chondro-sarcoma."

Clinical Notes and History. About a year before the commencement of the present complaint the dog was brought to the College suffering from paraplegia following being run over by a motor car. The paraplegia did not develop until two days after the accident, and as no fracture or other lesion was visible by X-ray examination at the time, it was concluded that the paraplegia was probably the result of effusion on to the cord in the lumbar region. The dog appeared to recover completely within ten days.

On the 14*th September*, 1926, the dog was brought back with the following history. A few days ago it was found lame one morning, and had been moving on three legs since. The owner had a suspicion that the dog had struck the leg when jumping a fence a short time previous to being seen lame.

On examination, the gluteals on the right side were atrophied and the great trochanter of the femur appeared to be enlarged, and there was some pain on passive movement of the leg at the hip joint. X-ray examination showed some enlargement at the base of the trochanter with blurring of the outline of the bone. The diagnosis was uncertain. My impression was that a contusion of the trochanter had taken place, and that the acute symptoms were now subsiding. The dog was sent home, with instructions to massage the hip region and bring the animal back in a month, or sooner if the lameness should get worse.

On the 23*rd September*, 1926, the dog was brought back, the lameness having got worse, and the enlargement of the great trochanter was now very definite and, owing to the rapid increase in size, a tumour of the bone was suspected. X-ray examination now showed undoubted tumour formation, and the animal was accordingly destroyed on the 27th September. (A photograph of the proximal end of the femur showing the tumour is shown herewith.)

*Remarks.* X-ray examination on the 14th September eliminated the possibility of the condition being a fracture of the great trochanter and showed the hip joint normal. The second X-ray film merely confirmed the suspicion, already aroused by the clinical history of the case, that the enlargement was due to a tumour. A point of interest in the paraplegia

occurring a year before is of some moment: where a dog is run over and does not develop paraplegic symptoms until twelve or twenty-four hours after an accident, in the majority of cases complete recovery will take place; therefore a hopeful prognosis can be given.

2. Section of Skull of Horse showing a Compound Composite Odontome.

The specimen was the skull of a two-year-old Clydesdale colt, in which a Compound Composite Odontome had apparently originated from the germ of the fifth left upper cheek tooth, and had encroached so much on the rest of the bones of the face as to obliterate the anterior half of the left frontal sinus, the left lateral mass of the ethmoid, the posterior part of the left nasal passage and, by pushing over the nasal septum, had partially closed the right nasal passage. The nasal septum, instead of being in the centre of the head, divides it in the proportion of 2 : 1. The odontome, having obliterated and dilated the maxillary sinus, has thin shell-like walls internally, the subcutaneous bony wall alone being thick and strong, and within this is a thick gelatinous membrane with here and there in patches embedded in it, small rudimentary conical teeth, each measuring $\frac{3}{8}$th by $\frac{1}{8}$th inches, giving a feeling such as is got by running a finger over the coarse teeth of a hoof rasp. In a separate bottle were shown hundreds of similar teeth, some loose and some embedded in gelatinous membrane, which were removed at an exploratory operation prior to destroying the horse.

Clinical Report. It is due to the kindness of Mr. Kerr, M.R.C.V.S., of Peebles, with whom I saw the colt on the 4th September, 1926, that I am able to report this case.

*History.* The owner stated that the colt had not been doing well since the beginning of the year, and about May a roaring noise was heard in the region of the head, but as the animal was running at grass it was not closely examined, it being thought that it was merely suffering from a cold. Lately, a swelling had been noticed on the left side of the face, and a slight discharge from the right nostril.

*On examination* the colt was in fair condition. The face was slightly twisted to the right side and there was an obvious swelling over the left maxillary sinus just above the zygomatic crest, which on percussion was non-painful and gave a dull note.

The left nostril was completely closed. and a roaring noise was emitted from the right nostril obviously due to partial occlusion. Examination of the cheek teeth from the mouth revealed nothing abnormal, there being four upper cheek teeth on each side.

*Diagnosis.* Idiopathic empyema of the sinuses, mucoid degeneration of the conchal bones, and some form of odontome, appeared to be possibilities, but no definite diagnosis was made at the time. It was arranged that an exploratory operation should be performed, but as prognosis was not hopeful owing to the marked anatomical changes already present, permission to destroy the animal if necessary, was obtained.

*Operation, 7th September,* 1926. Under chloral hydrate narcosis (one ounce in water given per rectum) the animal was placed on the operating table, and the area over the left maxillary sinus infiltrated subcutaneously with novacaine solution. An elliptical incision was made in the skin parallel to the zygomatic crest, over the facial swelling, and the periosteum removed; the bone was trephined, and immediately some yellow gelatinous fluid escaped with two or three rudimentary teeth. The opening was enlarged by gouge and bone forceps, and an attempt made to remove the contents of what appeared to be a cystic cavity. It was found to be so large that after scooping out about 6 ozs. of gelatinous material and rudimentary teeth, and the fact that the membrane was very vascular and had embedded in it here and there plaques of rudimentary teeth, the condition was recognised to be hopeless to extirpate completely, so the animal was destroyed.

*Remarks.* In an abridged form, I cull from Martin's compilation on *Tumours of Bone* the following:

"An odontome is a tumour composed of dental tissues in varying proportions and different degrees of development, arising from teeth germs or from teeth still in the process of growth." The definition is Bland Sutton's.

Odontomes as a whole are benign tumours of slow growth which expand the part in which they grow, and the majority of odontomes met with in the horse belong to the class of Composite Odontomes.

By far the commonest variety of composite odontomes is the complex composite odontome, in which enamel, dentine and cement are irregularly intermingled to form a dense calcified tumour. The case which I have described belongs to the variety compound composite odontomes, which is rarer than the complex variety. This is characterised by recognisable denticles formed within a mass of vascular tissue variably calcified and sometimes cystic. The denticles may be few in number or some hundreds may be present. The tumour is usually enclosed in a thin calcified capsule but its friable nature does not lend itself to removal in an intact state.

The foregoing remarks are founded on an article on Odontomes by Martin.

Reference: Martin, E. K., "Odontomes," *British Journal of Surgery* Supplement, *Atlas of Pathological Anatomy*, 1925-26, p. 76.

3. Osteomyelitis of the Radius, Dog.

This specimen was the right radius, of a small mongrel terrier, which had been boiled out, and showed an egg-shell like framework with a large central cavity at the proximal end of the bone, without involvement of the articular surface.

History. The dog was brought to the College, three days after it had been bitten by a large dog, with two punctured wounds, one on the dorsal and the other on the volar aspect of the upper part of the forearm, the dog being unwilling to put any weight on the leg.

*August 30th,* 1926. On admission, in addition to the two wounds, from which a little pus was

discharging, the limb was generally swollen in the region of the forearm. On palpation of the region of the injury there was considerable pain, but no fracture and no involvement of the elbow joint were found, and it was thought that the soft tissues only were involved. The wounds were enlarged by linear incisions and wet acriflavine (1 : 1000) dressings applied.

*September 3rd*, 1926. The amount of discharge appeared to be much reduced.

*September 6th*. The discharge became more profuse, and it was found on syringing the tract with eusol that a fistula passed right through the leg between the radius and ulna.

*September 10th*. The discharge continuing to be profuse, a splintered fracture of the radius was suspected, and the orifices of the wounds, which had shown some tendency to close, were enlarged.

*September 12th*. An acriflavine gauze drain was passed through the limb between the radius and ulna, and the whole part enveloped in a wet dressing, in the hope that if there was a sequestrum it might assist in its separation by providing free drainage.

*September 22nd*. The discharge being now more copious than ever, an X-ray photograph was taken in the hope of locating a sequestrum. Instead of this, a marked rarefaction of the whole thickness of the proximal end of the radius was shown. About this time an abscess broke through the skin of the axilla.

*September 29th*. As the prognosis was still poor and the owner was impatient at the slow progress, he requested that the dog should be destroyed. This was done.

*Remarks*. Direct injury to the radius appears to have resulted from the original bite, but the abscess which formed remained localised in the proximal part of the shaft, there being no direct communication between the abscess cavity and the medullary cavity of the radius.

4. Dilatation of the Oesophagus, Horse.

(Synonyms—Cardiospasm, Oesophagospasm.) This specimen was sent to me by Mr. P. Wilson, M.R.C.V.S., of Lanark, and is the combined œsophagus and stomach of a horse, which has been opened and shows great dilatation of the lower part of the œsophagus. In order to make the condition of matters clear, I have had photographed together the pathological specimen and a normal specimen (see photographs). Since Mr. Wilson was present at the meeting, he was kind enough to give the following history of the case.

*Clinical History*. Mr. Wilson said that when he was called to see the mare she was showing every symptom of being choked, and had attacks of retching. She was quite willing to take a mouthful of water, but that brought on more retching. He gave a hypodermic injection of morphia and had a hot pack applied to the lower part of the neck. He passed a stomach tube and then injected a good deal of tepid water, and before leaving gave another injection of morphia.

The next time he saw the mare she was no better, and as she was developing pneumonia he advised her destruction, which was carried out. The mare was aged and had very bad teeth.

*Discussion*. Mr. A. Gofton related his experience in the treatment of a similar type of case, where there were recurrent attacks of obstruction, and stated how attempts at dilatation of the cardiac orifice were made by means of graduated bougies, without success.

Professor Mitchell pointed out that the condition was by no means uncommon in man, it being most commonly known as cardiospasm. The exact mechanism of how a spasm occurrs at the cardia is not clear, for there is no circular sphincter arrangement of the muscle here. In man the treatment which has given the best results is digital dilatation of the terminal portion of the œsophagus from the cavity of the stomach, but the difficulties of such an operation in the horse are formidable, and as far as he knew, had never been attempted.

5. X-ray Photograph of Horse's Fetlock.

The following notes were contributed by Mr. W. H. W. Baird, B.Sc., M.R.C.V.S., D.V.S.M.

This specimen was from an aged bay hunter gelding, which, while hunting during March of last year, struck the off hind fetlock while jumping a wall.

On examination in the field, a wound was discovered on the front of the fetlock joint. Instructions were then given for the horse to be taken home immediately. On further examination at the stable the wound was found to be discharging synovia. This wound healed with no resulting lameness.

Later, the horse was sent on trial to a lady, and while being exercised by this lady, it went lame. The following day the fetlock joint was very much swollen and the animal was unable to support itself on the leg.

Treatment was adopted and the lameness improved somewhat, but the swelling remained. Major A. Baird was called in, and it was suggested that an X-ray examination be made.

By the courtesy of Dr. Hope Fowler, of Edinburgh, this was carried out in the operating theatre of the Royal (Dick) Veterinary College by kind permission of Professor Mitchell.

The photograph, taken on the 19th October, revealed an extensive periostitis and considerable deposit of new bony tissue around the joint.

This specimen was presented by Mr. W. H. W. Baird, who supplied the above information.

6. Sarcoma of the Vertebral Column in a Dog.

This specimen was the lumbar region of the vertebral column of a Labrador Retriever, from which the arches of the vertebræ were removed, showing the termination of the spinal cord, meninges and cauda equina *in situ*. Situated on the floor of the vertebral canal, and more towards the left side, a dark congested-looking new growth is seen arising from the bodies of the third and fourth lumbar vertebræ and the intermediate vertebral disc. The tumour appears to have erupted into the vertebral canal, and has there produced a definite oval projection

1¼ inches long by ½ inch in width, which has compressed the spinal cord and surrounding nerve roots without infiltrating the dura mater, and has led to softening of the spinal cord. Visible softening of the cord and degeneration of nerve roots extends from the second to the last lumbar vertebra, where the dura mater, which is incised longitudinally, is opened.

Pathological report by my colleague, Professor Matheson, on the histology of the growth: "Small spindle-celled sarcoma, with areas of necrosis."

CLINICAL REPORT.

*History.* The dog was sent to me on April 1st by Mr. T. M. Mitchell, M.R.C.V.S., D.V.S.M., Sunderland, with the history that on March 19th he had treated the dog for fecal impaction removing a large piece of bone from the rectum, after which it appeared much relieved, but in about ten days he was called to see the dog again, and found it apparently in acute pain of an indefinite nature, referable to the abdomen, and there had also been vomiting. In view of the previous illness he suspected that there might be a foreign body in the bowel, or possibly an intussusception, so sent the dog to me suggesting that an operation might be necessary.

On admission the dog looked miserable, and when made to rise did so somewhat reluctantly, there being some difficulty in using the hind limbs, and when rising a howl of pain was emitted.

On palpation, I found no tenesmus of the abdominal wall and nothing abnormal either by external or rectal palpation. Some slight pain was noticed on pressure over the lumbar transverse processes on the left side, which was suggestive of rheumatism. Temperature on admission was 102° F. In view of the indefiniteness of the signs on examination, no definite diagnosis was hazarded.

*Treatment and Progress Notes.* From the time of admission no vomiting was ever encountered, and after two days on liquid diet solid food was given, the bowels and kidneys functioning normally. The dog continued to feed well until within four or five days of the end.

*April 1st to 10th.* No marked change in condition occurred in spite of continuous dosing with aspirin and sodium salicylate.

*April 11th.* The dog appeared in greater pain, any movement voluntary or passive causing a howl to be emitted. It now began to dawn upon me that the pain in the lumbar region was associated with some lesion affecting the cord or nerve roots arising therefrom.

*April 12th.* Dog was worse, there being some spastic paralysis of the left hind leg, with marked plantar flexion of the toes on first rising, but after moving a few steps the toes became extended, and the foot was placed normally on the ground.

*April 13th.* Dog was very dull, lying continuously, but got up voluntarily when called. The right hind leg showed signs of commencing paralysis as seen in the left hind leg, and some muscular twitching was also seen over the shoulder muscles when the dog was lying.

*April* 14th. Dog still showed great pain but was now unable to stand on his hind legs.

*April* 17th. Pain now less marked, but appetite poorer, the dog beginning to lose condition.

*April 23rd.* Dog died.

*Remarks.* The abdominal pain in the early stages was probably referred as a result of irritation of the lumbar nerve roots, by the growth compressing them on the left side. Tumours affecting the spinal cord are, I believe, comparatively rare in the dog, but where paraplegia develops gradually the possibility of such being the cause should be kept in mind. Removal of the arches of the vertebral canal by means of bone forceps so that the cord and meninges are left intact in the vertebral canal in the best method of examining the region for a suspected new growth.

*Discussion.* Mr. GOFTON mentioned how in the slaughterhouses cases of encroachment on the vertebral canal were frequently seen as a result of tuberculosis of the bodies of vertebræ, in which there have apparently been no signs of interference with locomotion.

I am indebted to my assistant, Mr. G. B. Brook, M.R.C.V.S., for the photographs illustrating the foregoing cases.

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FOOT-AND-MOUTH DISEASE (BOILING OF ANIMAL FOODSTUFFS) ORDER.

The Minister of Agriculture has issued the following Order, which came into force on Monday, March 7th, 1927.

*Precautions to be adopted in regard to certain Animal Foodstuffs.*

1. Every person having in his possession or under his charge:—

(*a*) Any meat, bones, offal, or other part of the carcase of an animal; or

(*b*) Any swill or broken or waste foodstuffs which have been in contact with any meat, bones, offal, or other part of the carcase of an animal;

which are intended to be fed to animals shall cause all such foodstuffs to be boiled for at least one hour before they are brought into contact with or fed to animals.

Provided that this Order shall not apply to any prepared foodstuffs which have, in the course of preparation, been boiled for at least one hour.

2. In this Order "animals" means cattle, sheep, pigs, or goats.

3. If anything is done, or omitted to be done, in contravention of this Order the owner and person in charge of the animals, and the owner and person in charge of any of the above mentioned articles in respect of which the contravention is committed, and the person causing, directing, or permitting the contravention, shall each according to and in respect of his own acts or omissions be deemed guilty of an offence against the Diseases of Animals Act, 1894.

# DIVISIONAL REPORT.

## Royal Counties Division.

### Annual Meeting and Dinner.

### Professor Buxton's Presidential Address.

An inspiring Address from the chair by the President of the Royal Counties Division, Professor J. B. Buxton, of Cambridge, was the outstanding feature at the Annual Meeting of the Division, which was held at the Great Western Hotel, Reading, on Friday, 28th January, 1927.

The meeting was followed by the Annual Dinner, which proved a most enjoyable function, nearly every member having availed himself of the privilege of inviting friends. The meeting was attended by the following: The President, Mr. J. R. Baxter, Capt. H. B. Collet, Major G. W. Dunkin, Messrs. H. S. Dunn, C. J. N. Godfrey, H. R. Hewer, G. P. Male, J. W. McIntosh, Capt. W. L. Little, Major G. B. C. Rees-Mogg, Major E. E. Seldon, Col. P. J. Simpson, Major F. J. Taylor, Major R. C. Tennant, Major C. Townsend, Mr. F. T. Trewin, Major E. G. Turner, Messrs. E. Wilkinson, F. W. Willett, J. Willett, Professor G. H. Wooldridge, and Major R. Catmur (Hon. Secretary).

*Visitor.*—Mr. J. H. Shepherd.

Apologies for inability to attend were sent by Mr. J. H. L. Addis, Capt. W. A. Austin, Capt. A. Barr, Messrs. A. J. Baxter, I. R. Coleman, J. C. Coleman, Major P. W. Dayer-Smith, Lieut.-Col. A. F. Deacon, Major A. C. Duncan, Mr. E. J. Gill, Major F. T. G Hobday, Capt. T. M. C. Hunt, Major H. C. Jagger, Major H. G. Lepper, Mr. T.-W. Lepper, Mr. J. McKerlie, Major-Gen. Sir J. Moore, Mr. W. Pauer, Professor S. Pennington, Mr. S. H. Slocock, Major S. L. Slocock, Mr. C. N. Thompson, and Capt. S. Villar.

The *minutes* of the previous Annual General Meeting, having been published in the *Record,* were confirmed and were signed as correct.

The President, receiving a negative reply to his enquiry as to whether or not it was desired that the Secretary should read the rules of the Division, said that he would like to suggest that the Council should go carefully through them and advise the members as to any alterations therein which they might think desirable, in due time for the next Annual General Meeting. He thought that perhaps some of the rules might be brought up to date, but that could not be done without due notice being given. Upon the proposition of Professor Wooldridge, seconded by Colonel Simpson, it was agreed that this course be adopted.

### Correspondence.

(1) From the Secretary of the N.V.M.A. drawing the attention of the Division to the recommendations made in the report presented to the Central Division by its delegate to the Royal Sanitary Institute Congress.

The President: I expect that all of you have read that very excellent report of Sir John Moore's, and I take it, therefore, that you do not wish it read now. If the "National" is taking action there is no reason why we should not support that action, if we feel so inclined.

It was agreed to write to the Secretary of the Royal Sanitary Institute in support of the proposal, *viz.*, that the Institute should substitute for the name Veterinary Inspectors' Conference in connection with their Congress, a title more in keeping with the dignity and range of duties of those engaged in veterinary public health work.

(2) From the Secretary of the Royal Sanitary Institute inviting the Division to appoint a delegate to attend the Annual Congress of the Institute to be held at Hastings in July.

It was decided that a delegate be sent, and that his expenses be paid. Captain Little was appointed to represent the Division.

(3) From the Secretary of the N.V.M.A., requesting the opinion of the Division as to whether or not the time had arrived for the control of cows reacting to the tuberculin test and, if so, what form that control should take.

The President: I think you will agree that it would be well to deal with this matter at once, as I feel that the opinion of this Division might be very helpful to the "National." We have two questions before us, and I think we will deal with them separately. I should be glad to hear what you have to say in regard to the first, as to whether or not the time has arrived for the control of reacting cows.

Mr. Male: This has not been put on the Agenda. Do you not think that we should get a much better discussion if we had time to think about it and could come prepared to express definite opinions?

The Hon. Secretary: This letter did not arrive in time to allow of this matter appearing on the Agenda. Our next meeting is a joint one with the B.M.A. and our summer meeting is a social occasion.

The President: If we found to-day that matters arising out of this were very controversial, we could postpone its consideration.

Major Dunkin: I do not think that we are a competent body to deal with this question; I feel that it is altogether too big a question for us, and one in which we should work in conjunction with the big breed societies.

The Hon. Secretary expressed the view that respect for the test amongst the farmers should be increased before anything was done to earmark reacting cattle.

Mr. Male: You will probably all be aware of the reason why this matter was considered by the "National": it was on a resolution from the North of England Division, which was of opinion that there should be some control. Most of us would be in agreement with that if it were practicable, but there are a great many difficulties in the way, unless the disease can be controlled as it is in America, in some degree. There they have State testing of all cattle in certain areas, and when they have tested and eliminated to such an extent that they have got the

herds almost free from tuberculosis they call it an accredited area, and people can buy cattle from that particular area with greater confidence. In England there are no areas that could be called accredited—the Reading district is our nearest approach to it at the moment (laughter), but even there there are probably some herds the owners of which have bought those unfortunate cows that have been tested and reacted, and they have probably got a larger percentage than they otherwise would have, so it is very, very difficult. It seems wrong for a man to have his cattle tested and then to sell them in the open market for unsuspecting buyers to introduce the diseased cows into their herds, but I do not think that there are many unsuspecting buyers at the present moment.

If there was control, each test would, I expect, have to be notified and careful records kept, also, the cows would be branded, and I think that neither the veterinary surgeon nor the farmer would agree to that. It would put a stop to a great deal of testing.

Major Catmur seemed to think that the test was becoming unpopular: my own impression is that it is becoming more and more popular every day, and that there are more and more cattle being tested all over the country. With regard to the production of graded milks, the difficulty seems to be the sterilising apparatus and the cowsheds, but the dairy farmer is beginning to realise that it does not cost a great deal to attain such a state as would enable them to be passed by an inspector, and that a sterilising apparatus does not cost a great deal either; also that ordinarily intelligent farm hands can carry out these methods with a little help. I think that the test is gradually increasing in use and that the general opinion in regard to its reliability is also changing for the better. Farmers are realising the benefits of the test. In this district they are only too keen to have it carried out, so that, in my view, it would be a mistake to ask for control at this moment, except under special circumstances, as at the shows in London where (and this is a step in the right direction) breed societies should insist that no cow shall be shown unless she has been tested. I think that by working along these lines and by making the most of the Milk and Dairies Order, and the Tuberculosis Order, we shall do more good than by State control of reacting animals.

The Hon. Secretary: I did not suggest that testing is not becoming more general, but I do feel that amongst the ordinary farmers there is a distrust of the test. It is the man who has not got big or pedigree herds who has got to be convinced of the necessity for the test and of the fact that it is a financial proposition for him. Three years ago, at Bath, Mr. Male read a paper on this subject and, as I said then, we have started at the wrong end. We have left the small man, who is producing dirty milk, alone: we have got to instil the idea of the value of the test into the small producer. The rank and file of the farmers are not convinced, and it will take a very long time to convince them.

At this point the President took the feeling of the meeting, when a proposition "That the time has not yet arrived when cows reacting to the tuberculin test should be controlled," was carried *nem. con.*

This point having been agreed upon, the second did not arise.

*Auditor's Report and Balance Sheet.*—In proposing the acceptance and adoption of the Auditor's report and balance sheet (which revealed a very satisfactory state of affairs), Mr. J. Willett congratulated the Division on its financial position. They would notice that the balance at bank had been practically doubled during the past year. At the same time, he would like to congratulate the Treasurer (Mr. Male) on the way in which the books were kept.

Lieut.-Col. P. J. Simpson seconded the proposition, which was carried unanimously.

Mr. G. P. Male said that, as they would see, the subscriptions came in extraordinarily well during the year, and he must thank the members very much indeed for the way in which they had fulfilled their obligations in that respect: it had been a great help to him and to the Division. Some of the arrears of subscription, too, had been paid up, and the amount outstanding at the end of 1926 was only £10. With their approval, he would like to add a certain amount to the Division's deposit account.

An alternative suggestion was made that the Division should make a contribution to the Royal Veterinary College Rebuilding Fund, and after discussion it was agreed to send the sum of fifteen guineas, as a first donation.

*Election of Representatives to the Council of the N. V.M. A.*—These were elected as follows: Lt.-Col. P. J. Simpson (re-elected), Mr. J. W. Willett, and the Hon. Secretary (*ex-officio*).

Colonel Simpson and Mr. Willett thanked the members for their election.

*Election of Representative to the Council of the Victoria Veterinary Benevolent Fund.* — Lt.-Col. Simpson was re-elected as the representative of the Division.

Lt.-Col. Simpson drew the attention of the members to the fact that he was staging a dramatic entertainment in London, for the benefit of the Fund, on Friday, April 8th, which is the day of the meetings of Council, both of the Fund and of the R.C.V.S. He appealed to members both to purchase tickets, and to invite their clients to make contributions towards the expenses of the show in those numerous instances in which no fee was taken for small items of attendance.

*Election and Nomination to Membership.*—Major-General Sir John Moore was unanimously elected to membership of the Division, and Mr. T. G. Chamberlain (Abingdon) was nominated as a member.

### Cases of Interest.

Mr. G. P. Male: I have a St. Bernard bitch here. She is one year old, and six months ago she had rather a bad abscess on the inside of the thigh. It formed rapidly and when she was brought to us she had a very high temperature, was blowing, unable was to walk, and altogether was in a very bad way indeed. Mr.

THIS YEAR'S HOLIDAY FIXTURE: TORQUAY, SEPT. 12-17.

Dunn opened the abscess and there was a tremendous discharge. Later on secondary abscesses formed in various parts of the body. Since that time she has had septic arthritis of the stifle joint, which has produced a fibrosis, so that the bitch is now devoid of movement in the joint. She resents it being handled and carries the foot two or three inches from the ground. When we saw it coming on we advised external applications and massage, and tried to get the bitch to use the limb, but she will not attempt to use it at all. I have got some X-ray photographs of the joint and you will see exactly what has happened.

The question now arises, what is the next thing to do—whether to break down the adhesions, or not? In that case we might free the joint, but I am afraid she would not use it and in a month's time it would be just the same as it was before.

Major TENNANT: A very good way to get rid of a stiff joint is to swim the animal.

MR. MALE: I have another live exhibit here. This is a valuable Sealyham bitch into which we grafted some ovaries about three months ago. She had got very fat and lethargic and she had no proper heat. She had two litters of puppies in 1922 and 1923 and had been served in 1924, but did not prove in whelp, and her heats were most irregular. Mr. Gregg, who attended her, diagnosed that the ovaries were diseased, and we performed ovariotomy on a bitch, and grafted half an ovary into each side in the region of the flank. Since that time she has been altogether different in her appearance. She now runs about and plays and seems many years younger. She had quite a normal heat and was mated on January 18th, and it will be interesting to record the result. (Hear, hear.) I might say that the operation wound healed by first intention, and that there was no difficulty in the after treatment. For some time you could distinctly feel the ovaries in the flank but now, after four months, you can only just detect them.

The PRESIDENT: It will certainly be very interesting to know whether or not she comes in whelp because, as you know, a similar operation has been tried in the human female, when the difficulty has been experienced that the cells do not last.

Mr. MALE: I wish to relate another rather interesting case (though here I cannot accompany my description of it with an exhibit). A bull (laughter) got injured in one testicle, and there was an abscess formation in the scrotum on one side. He showed no inclination to serve his cows, so I grafted part of the testicles of a fairly large calf into each groin. They took wonderfully well and since that time (this was three months ago) he has shown every sign of being very vigorous. He has served his cows and we believe that they are in calf, though we do not quite know yet.

*(To be continued).*

## NOTES AND NEWS.

**The Editor will be glad to receive items of professional interest for inclusion in these columns.**

### Clinical Prize Scheme for Students.

We desire to direct the attention of students at the various Veterinary Colleges to the Regulations governing the above scheme. These will be found in full in the Notices column of this week's issue of the *Record*.

### The "Benevolent" Aid Performance.

We would remind our readers that the box office for the booking of seats for the Amateur Performance in aid of the funds of The Victoria Veterinary Benevolent Fund opens on Monday next, March 14th. We hear that there has already been a fair number of applicants for seats and as all applications will be dealt with as received our advice to all is:—*Book early and secure good seats, see a good show and support a good cause.* The Presidents of the Benevolent Fund, the Royal College of Veterinary Surgeons and the National Veterinary Medical Association have intimated their intention of being present and it is hoped that they will be well supported by their respective officers and councilmen.

### Veterinary Adviser in the University of Liverpool.

Mr. K. D. Downham, B.V.Sc., M.R.C.V.S., D.V.H., has been appointed Veterinary Adviser in the Department of Veterinary Pathology, University of Liverpool.

Prior to the war, Mr. Downham had over four years' experience in agriculture in various parts of England, and on the outbreak of war was Asst. Horse Superintendent to the London & North Western Railway. He served with the army throughout the war. After 4¾ years with the army, he entered upon his course of studies in veterinary science in the Veterinary School of the University of Liverpool.

Mr. Downham had a distinguished career as a student and took a prominent part in athletics. After graduation he acquired practical experience with veterinary practitioners in several parts of England, and served as a Special Veterinary Inspector of the Ministry of Agriculture in connection with foot-and-mouth disease for periods amounting to over a year in all. Finally, he conducted his own practice in Liverpool, spending all his spare time voluntarily assisting in the new Department of Veterinary Pathology in the University.

As Veterinary Adviser, Mr. Downham has a seat, with Professor Gaiger, on the Manchester University Consultative Committee for Agricultural Research for the counties of Lancashire and Cheshire, and one of his first duties will be to take part in an enquiry, with Professor Gaiger, into deaths amongst ewes in Yorkshire, in co-operation with Colonel Bowes of the Agricultural Department of the University of Leeds.

### Cavalry Organisation Changes.

The Army Estimates of Effective and Non-Effective Services for the year 1927 were issued on March 3rd. (No. 23, 5s. 6d. net), and were accompanied by a Memorandum of the Secretary of State for War (Cmd. 2810, 3d. net) in the course of which it is stated:—"During the past year the Cavalry requirements of the Army have been under consideration with a view to bringing the organization of this arm up to date and, at the same time, securing the maximum degree of economy.

"The measures decided upon include: (i) the abolition of the Cavalry Depôt and the concentration of the training of recruits in regiments; (ii) the reduction of one squadron in each of the twelve regiments at home; (iii) the mechanization of the 1st Line Transport of the Cavalry by certain stages, beginning with the six regiments comprising the 1st and 2nd Cavalry Brigades.

"The net effect of these proposals, together with certain minor adjustments, is a reduction of forty-seven officers, 1,294 other ranks and 1,445 horses in the twelve regiments at home."

### A Lancashire U.D.C. and the Milk Regulations.

The report of a meeting of the Turton (Lancs.) Urban District Council, given in a recent issue of the *Bolton Evening News*, states:—"After full discussion of a report on the Milk and Dairies Order (1926), the Health Committee passed the following resolutions which are now confirmed by the Council: (1) That notices be served on cow keepers and dairymen, where in the opinion of the Sanitary Inspector such notices are necessary, requiring them to bring their cowsheds and dairies up to the standard required by the Order, and provide a suitable and sufficient supply of water; (2) That notice be forthwith served on every cow keeper, drawing his attention to the requirements of the Order as to the cooling of all milk not retailed immediately after milking; and (3) That the Clerk be empowered to serve any legal notice required to be served on a cow keeper or dairyman for compliance with the requirements of the Milk and Dairies Order upon the report of the Sanitary Inspector that any article of the Order is not being complied with.

### Foot-and-Mouth Disease.

At the last Council Meeting of the Royal Agricultural Society, Sir Merrik Burrell expressed appreciation of the result of the Orders of the Minister of Agriculture with regard to foot-and-mouth disease last year and of the energetic and efficient work of his veterinary staff. When one studied the figures which Sir John M'Fadyean had given, he thought it was rather wonderful that the disease had been checked in this country, while it was raging on the Continent. In 1926 the outbreaks of the disease in Great Britain and Continental countries were:—Great Britain, 204; Belgium, 35,519; France, 48,959; Holland, 62,656; Denmark, 97,434; Germany, 187,527.

Those who had read the progress report of the Committee which was conducting research into this disease would have seen how very conclusive the evidence was as to the necessity for maintaining the embargo on the importation of fresh meat from the Continent. He congratulated the Minister once more on the firm stand he had taken up on this question, in spite of all the opposition he had encountered.

### R.C.V.S. Obituary.

Chappell, William H., Seaford Haven, Avenue Road, King's Lynn. Graduated London, 16th May, 1895. Died 1st February, 1927.

Conchie, James Robert, 1 Selbourne Villas, Minehead, Somerset. Graduated London, 17th July, 1909. Died 27th February, 1927.

Gately, Ambrose Paul. Graduated Liverpool, 7th July, 1920. Died 2nd March, 1927.

Pickwell, George Herbert, Cropwell Bishop, Bingham, Notts. Graduated London, 8th December, 1885. Died 27th January, 1927.

Selous, Bruce, 12 Ridding Lane, Wednesbury, Staffs. Graduated Edinburgh, 22nd May, 1907. Died 28th February, 1927.

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The funeral took place at Minehead on March 2nd, of Major James Robert Conchie, M.R.C.V.S., officer commanding the 43rd (Wessex) Divisional Mobile Veterinary Section.

Almost the whole of the unit paraded for the funeral. Six acted as bearers, and the others marched behind the hearse. They were in the command of Major T. Sealy Green, D.A.D.V.S., who represented Gen. Sir J. Jeffreys, K.C.B., G.O.C. the 43rd Division.

Among those at St. Andrew's Church were Lieut.-Col. W. Hartley Maud, C.M.G. (representing the Somerset County Territorial Army Association, and president of Minehead British Legion), Lieut.-Col. V. D. Stenhouse (Vice-Chairman of the local British Legion), and Mr. J. Irwin (hon. secretary).

### "Clean Milk" Party.

As a sequel to the recent visit of the Fourth *Veterinary Journal* Party to the Municipal Milk Distributing Depôts of Copenhagen and Stockholm, arrangements have been made, at the kind invitation of the Directors of the United Dairies Co., to visit their large pasteurising and bottling depôt at Streatham, on the afternoon of Thursday, March 17th. Mr. Tustin, the Company's technical adviser, will meet the party and explain the machinery and the details of the process. The party will afterwards visit premises near by, where a demonstration will be given of the use of Mr. Weinberg's machine to obviate the present method of casting and securing cattle when subjected to the Jewish method of slaughter.

All members of the profession and college students who wish to accompany the party can obtain full particulars upon application, at once, to the Editor, *Veterinary Journal*, 165 Church Street, Kensington, W.8.

### H.M. Stationery Office Publication.

The undermentioned has been published during the week. Copies can be purchased through any bookseller, or directly from H.M. Stationery Office, at the following addresses:—London: Adastral House, Kingsway, W.C.2, and 28 Abingdon Street, S.W.1; Cardiff: 1 St. Andrew's Crescent; Manchester: York Street; Edinburgh: 120 George Street.

| | *Price Net.* | *Post Free.* |
|---|---|---|
| | s. d. | s. d. |
| Statutory Rules and Orders, 1927:— | | |
| 97. Animal. Diseases of Animals. The Foot-and-Mouth Disease (Boiling of Animal Foodstuffs) Order of 1927, dated February 25th, 1927 | 0 1 | 0 1½ |

### Personal.

"Mr. Warwick Fowle, the well-known Birkenhead veterinary surgeon, is," says the *Birkenhead News* of March 2nd, "still confined to bed in consequence of being badly bitten by a cat which he was treating. Mr. Fowle received bites on both hands, the cat showing sudden viciousness, and unfortunately septic conditions were set up, which have necessitated the amputation of one finger on Mr. Warwick Fowle's left hand. The amputation was performed on Sunday by Dr. J. B. Oldham, of Rodney Street, Liverpool, and Mr. Fowle is making satisfactory

progress, but will necessarily be incapacitated for some little time."

*Birth.* PEATT:—At Quetta, N. India, on the 7th February, 1927, to Gertrude, wife of Captain E. S. W. Peatt, R.A.V.C., a daughter.

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ARMY VETERINARY SERVICE.

LONDON GAZETTE. WAR OFFICE. TERRITORIAL ARMY.

March 1st.—Capt. L. P. Pugh to be Major (Prov.) (February 14th).

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CONCERNING TUBERCULOUS CATTLE.

In connection with the proposed new herd of tubercle-free cows to supply milk to Edinburgh hospitals, the Public Health Committee of Edinburgh Town Council visited Colinton Mains farm with the object of inspecting the accommodation required. Dr. William Robertson, Medical Officer of Health for the city, and Mr. A. Gofton, the Chief Veterinary Inspector, in a report on the subject, stated that in considering the question of buildings it must be remembered that a fundamental difference arose in the maintenance of a tubercle-free herd as compared with the maintenance of a milking herd on existing lines. In the latter case numbers were maintained by purchase in the open market as required, whereas in the former the herd must in a very large measure be self-supporting: that was to say that provision must be made for replacements and additions by breeding, and by the rearing of young stock.

At present there was no appropriate accommodation for calves or for young stock at Colinton Mains Farm or at Oxgangs. They had reached the conclusion that the modification of the existing buildings to suit the requirements of a tubercle-free herd would not prove satisfactory, but would lead to the introduction of materially adverse factors and to difficulty in the transition from non-tested to a tubercle-free herd. They therefore recommended that new byre accommodation be provided for 30 cows, and that as the existing byre accommodation became available by the reduction in numbers of the existing herd it should be utilised for calves and young stock, subject to the necessary alterations. The alterations necessary for this purpose would not be extensive, and it was anticipated that the accommodation would become available as early as it would be required.

The question is to be discussed at a later meeting of the Committee.—*Glasgow Herald.*

The grave danger of milk affected with tuberculosis affecting human beings was emphasised at the Northallerton Police Court, by Dr. Mason, the medical officer for the North Riding, when William Dixon, farmer, of Thorn Flatt Farm, East Harlsey, was charged with having failed under the Tuberculosis Order, 1925, to notify that a cow in milk was suffering from tuberculosis.

Superintendent Sinnott said that in consequence of a letter sent to the Ministry of Health, Mr. E. H. Pratt, veterinary surgeon for the North Riding, visited the defendant's farm and found a cow coughing. The animal was slaughtered and found to be affected with tuberculosis. He was asked to bring to the notice of the Bench the seriousness of the case, because Dixon was sending out large quantities of milk to an area which he would not name, and was also supplying the village of East Harlsey.

Mr. E. H. Pratt said that in consequence of instructions he went to the farm and examined the stock. He came to the conclusion that one cow was suffering from tuberculosis. The animal was slaughtered and was found to be badly affected with tuberculosis. The defendant said he had slaughtered another cow about a month ago.

The defendant said he was unaware the cow was suffering from tuberculosis. He was of opinion that his man had given the animal too much meal.

Dr. Mason said that the milk of a cow of this description might transmit tuberculosis to children, and result in them being crippled or even cause death. He considered this case a serious one from a health point of view. They were spending large sums of money in treating people for tuberculosis, and yet there was a grave danger of it being spread by milk of this character.

The defendant said he was entirely ignorant. If he had known he had to report the cow he would have done so.

The Chairman, after the Bench had consulted in private, said they had decided to impose a fine of £10. It was a very serious offence and the fine would have been larger if it had not been the first case that had been brought before the Court.—*Yorkshire Herald.*

At a meeting of the Perth County Executive (under the Diseases of Animals Acts) the Clerk reported that for the quarter ending December 31st last, twenty-eight cases had been reported under the Tuberculosis Order. Twenty-four were confirmed, and of those nineteen were very advanced cases. The total valuation of the cows was £247 10s., and the compensation payable was £85 10s. The veterinary inspector's fees amounted to £68 9s. 6d. The Clerk was instructed to make a return showing how many cases had occurred in dairies and how many on farms during the year.

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SALE OF WORN-OUT HORSES.

STATEMENT BY REPOSITORY OWNERS.

The name of the Elephant and Castle Repository was mentioned in remanded cases at Old Street Police Court on February 23rd, in which cruelty to horses was alleged.

Mr. Percy Robinson attended on behalf of the Repository, and said that Mr. Tilling, who had been chairman of the Repository for many years, was grieved on hearing of certain remarks by the magistrate (Mr. Clarke Hall) on a previous occasion, because he thought, not that the magistrate had done the Repository any injustice but that injustice had been done by people who came before him, and who had frequently stated that they had bought horses at the Repository when they had not bought them there. The Repository were in the position of being mere agents, horses being sent there for sale and being purchased for a variety of purposes. Very often people who purchased a horse were so ignorant that they did not know how to feed it or how to treat it in the event of its becoming ill. Frankly, in view of what had happened they would take special steps to examine horses and see that none unfit for work should be sold for the road, but certain difficulties existed and were bound to exist. The Repository had had a very high reputation, and was most anxious not to cause cruelty to any animal.

Mr. Clarke Hall said the last thing in the world that he desired was to injure the Repository or anyone else. He knew Mr. Tilling by reputation and that he would be the first to assist in that matter.

[A communication relative to the above will be found in our Correspondence columns.—Ed.].

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At the annual meeting of the British Friesian Cattle Society it was reported that the membership is now 1,959, and that the funds in hand amount to £28,627. No fewer than 240 cows with milk yields exceeding 2,000 gallons in a lactation period of not more than 365 days have now been officially recorded in this country. Of that group seven have passed the 3,000 gallon mark.

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*Spillers Victoria Foods. The following Dog Shows have been, or will be, benched and fed by this firm during the present month:*—2nd, Liverpool Members' Cup Show; Members' Show, Bridgend; 10th, City and Suburban Canine Society Show, Crystal Palace; 15th, French Bulldog Show, Marylebone Hall; 16th, Llandudno Show; Samoyed Association Show, Marylebone Town Hall; Surrey County Canine Members' Show, Dorking; 17th, Irish Kennel Club Show, Dublin; 24th, Peterborough and District Members' Show; 26th, Joint Bulldog Club Show, Bradford; Birkenhead Members' Show; Southport and District Canine Society Show; Cardiff Canine Society Members' Show; 30th, Mitcham and District Canine Society Show, Croydon.

# CORRESPONDENCE.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

## The Veterinary Surgeon and Public Health.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—It was with great interest and appreciation that I read Mr. Gladstone Mayall's letter on this subject, in which he congratulates Col. J. W. Brittlebank on his practical views concerning the duties of a whole-time officer and his relation to general practitioners. I think the time has arrived when the R.C.V.S. should apply for a Supplementary Charter to carry out the ideas of our President.

Local authorities would welcome a well-thought-out scheme which would meet their object in view and yet provide the necessary number of general practitioners, whose work has such an influence on public health.

I have examined my diploma and find that the Board of Examiners have found me "fully qualified to practice the Art and Science of Veterinary Medicine and Surgery." It can scarcely be said that a veterinary surgeon in private practice at the present time is being allowed to do so. With the appointment of whole-time county and burgh veterinary officers (by order of the Scottish Board of Health) under the Milk and Dairies Act, the private practitioner is absolutely ignored, steps are taken by these authorities to prevent him submitting any animal to the tuberculin test, which belongs to a certified or grade A (T.T.) herd. Even for the ordinary commercial sale of such an animal the county grant the necessary certificate free of charge. In looking over the Milk (Special Designations) Order, I notice that the certificate of the approved veterinary surgeon is for the use of the Licensing Authority, but there is no authority for such a free certificate going to another party for the purpose of a sale. I raised this point with a client recently and was informed that it was now customary to get the tuberculin test certificate from the whole-time man and thus save the fees of a private veterinary surgeon. I wonder if Col. Brittlebank encourages this form of economy?

Who knows the history of a herd better than the general practitioner? His frequent visits stand out in marked contrast to an annual inspection made by a whole-time man. In some counties the private practitioners are ignored by the local authority. I agree that the confidence and co-operation of the practitioner are necessary before any whole-time official can get the best results out of his work.

In my district I know of two outbreaks of foot-and-mouth disease which were speedily got under control through the initial actions of the local practitioners concerned.

I agree with Col. Brittlebank that a whole-time official is valuable as an administrative officer, leaving the field work to members practising in the various districts. Close co-operation between the parties would make for an efficient Public Health Service.

It must be borne in mind that veterinary surgeons are ratepayers in their own area and thus entitled to some consideration from their local authority.—Yours faithfully, JAMES F. TAYLOR.

Rutherglen,
*5th March*, 1927.

## The Eradication of Tuberculosis.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—We have heard of late a great deal about what is being done to suppress tuberculosis in these islands. But by all accounts the disease is steadily progressing. During the week ending Saturday, March 5th, out of forty-six samples of milk tested in London, twenty-eight were found to contain tubercle bacilli. These samples were taken from milk arriving from Leicestershire, Northamptonshire, Cheshire and other milk-producing counties. Perhaps those engaged in the testing of cattle with tuberculin can explain. No progress has been made in diminishing the disease and what is being spent on the carrying out of this test is a sheer waste of money. Until all cattle are tested and the reactors controlled no improvement in the milk supply can be expected.

It is pure nonsense to think that only cows with tuberculous udders are passing tubercle bacilli in their milk. The question may well be asked "whether the time has arrived for exercising some form of control over cows that have reacted to the tuberculin test"—and one may consider to what extent such control should be practised in face of such facts.—Yours faithfully, HENRY GRAY.

Kensington,
5th *March*, 1927.

## The Sale of Worn-Out Horses.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—The publication in to-day's *Daily Mail* of some particulars of a case at Old Street Police Court, in which a man was fined and suffered the loss of three animals for taking worn-out horses by road to the Elephant and Castle horse-repository for sale, raises two important questions affecting the responsibilities of horse-owners and veterinary practitioners in London as well as the authorities of the repository:—(1) There should undoubtedly be provided in the sale arrangements of the repository a separate list or category in which all horses no longer fit for work or breeding would be included, with safeguards to ensure that such horses are sold only for early destruction as "butchery" cases; (2) Owners sending horses intended for disposal in this way should be protected from prosecution for walking the animals a reasonable distance to the repository if the animals are certified by a responsible veterinary practitioner as fit so to proceed. It is, of course, a commonsense fact that worn-out horses may well be fit to walk a few miles to a place of sale and thence to the slaughter-house; a prosecution based upon a contrary assumption might be tyrannous and an abuse of the powers given to inspectors and others under the Cruelty to Animals Acts. These observations are made without prejudice to the case at Old Street Police Court, because I did not see the horses, and recognise that it may have been proved that all these animals were by reason of lameness or other disability unable even to walk a reasonable distance without suffering considerable pain and distress.—Yours faithfully, J. W. RAINEY.

20, High Street,
Bow, London, E.3.,
*24th February*, 1927.

*The Editor acknowledges the receipt of the following:*—

Report of a meeting of the Midland Counties' Division, from Mr. H. J. Dawes, Hon. Secretary, together with a report of the meeting of the Northern Branch.

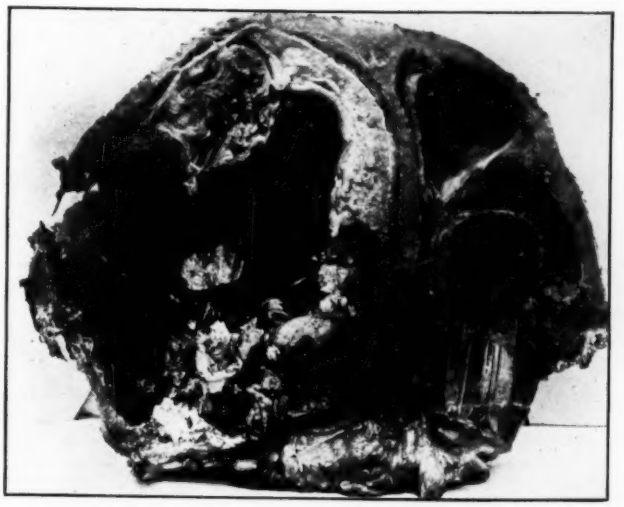
Communications from Capt. W. F. Aston, Major F. Chambers, Capt. A. W. Noel Pillers, Capt. W. R. Townson, and Mr. E. H. Pratt.

**National Veterinary Medical Association of Great Britain and Ireland.**

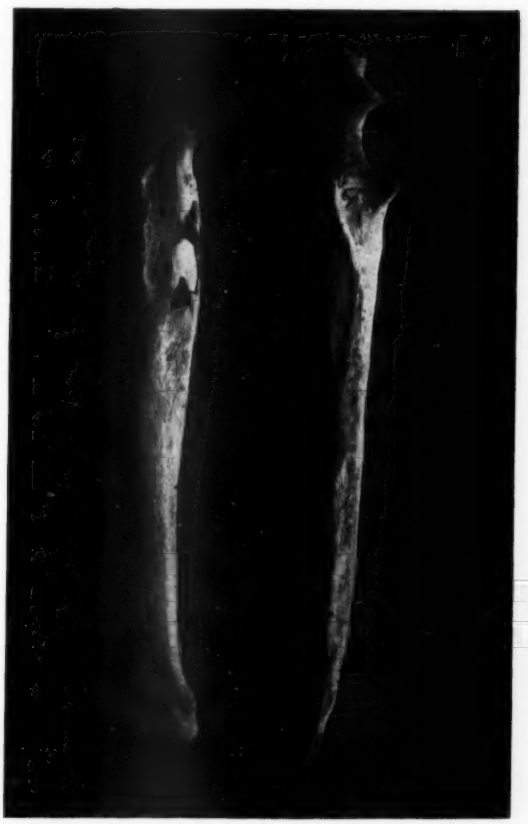
**EDITORIAL OFFICE: 10 Gray's Inn Square, London W.C.1.**

**All communications relative to the literary side of the Veterinary Record must be addressed to the Assistant Editor, "Veterinary Record," 10 Gray's Inn Square, W.C.1**

CASE I —Myxo-Chondro Sarcoma of Femur of Dog.
(The tumour has been excised longitudinally.)



CASE II —Compound Composite Odontome in Skull of Horse.
(Section across skull, looking forward.)



CASE III.—Osteomyelitis of the Radius of Dog.

CASE IV. Dilatation of Œsophagus of Horse.
(Specimen on right is a normal œsophagus and portion of stomach for comparison)

CASE V.—X-ray Photograph of Horse's Fetlock.
(Showing deposit of new bony tissue around the joint.)